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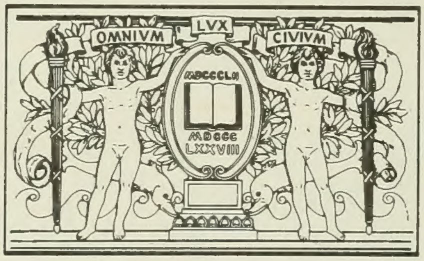

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PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106

Federal Motor Vehicle Safety Standards; Brake Hoses

[Docket No. 82-09; Notice 2]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 106, *Brake Hoses*, by allowing the use of brake hoses that are labeled in metric sizes. The agency received a petition for rulemaking from Saab-Scania to amend Standard No. 106 to allow the use of millimeter sizes in the labeling of air brake hose. The agency issued a notice of proposed rulemaking which proposed to allow manufacturers to label their brake hoses with metric units, and provided performance requirements in the standard for metric-sized brake hoses which were equivalent to the present requirements for English-sized hoses. This final rule primarily addresses Saab-Scania's petition to allow the use of brake hoses manufactured in metric sizes and is thus more limited than the proposal.

EFFECTIVE DATE: June 3, 1985.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard (FMVSS) No. 106, *Brake Hoses*, sets performance and labeling requirements for brake hoses used in motor vehicles. Sections 7.2.1(d) and 7.2.2(d) of FMVSS No. 106 require that air brake hoses and end fittings be labeled for size in inches or fractions of inches. The standard currently permits information such as metric labeling to be placed on hoses as additional information.

In June 1981, the agency received a petition for rulemaking from Saab-Scania to amend sections 7.2.1(d) and 7.2.2(d) to permit labeling in metric units as an alternative to inches. On April 12, 1982, the agency published a notice in the Federal Register (47 FR 15612) granting the petition and proposing that various sections of the standard be amended to permit labeling in metric units.

The notice explained that permitting use of metric sizes is consistent with Federal policy concerning metric conversion and that the proposed amendments would aid international harmonization. As the agency has explained in other notices, international harmonization can result in decreased costs, benefiting both consumers and manufacturers, without an adverse effect on safety. In issuing the notice, the agency emphasized that the proposed amendments would not make any change in performance criteria applicable to a particular size of hose. The notice included performance requirements for the new metric sizes of brake hose which were the same as the requirements for brake hoses of comparable English sizes.

Although the language of this amendment uses the terms "hoses" and "tubing," it is emphasized that "brake hose" comprises both terms. Standard No. 106 defines "brake hose" as a flexible conduit, other than a vacuum tubing connector, manufactured for use in a brake system to transmit or contain the fluid pressure or vacuum used to apply force to a vehicle's brakes. As explained in past Federal Register preambles, the term "brake hose" includes traditional rubber hose and plastic tubing. All brake hoses are subject to the standard and to appropriate tests for the environment in which they serve.

The agency received a number of comments on the proposal, all of which have been carefully considered. Most commenters supported the concept of permitting labeling in metric units. Some commenters suggested various ways to rewrite parts of the standard for purposes of clarity or to address safety concerns not directly related to the proposal. The agency may consider these suggestions, as well as other issues, as part of its efforts to modernize Standard No. 106 to address current technological developments in the industry. However, in order to resolve the specific concerns raised by the Saab-Scania petition, the agency has decided to limit its actions at this time to adopting a final rule which directly addresses Saab's petition.

This final rule permits the use of brake hoses and end fittings that are labeled in metric units. In response to concerns raised in the comments that it might be unclear whether a hose or fitting is inch-sized or metric-sized if the unit of measurement is not included in the label, the final rule requires that metric labeling include the abbreviation "mm" to designate that the labeled units are metric. Finally, the final rule does not adopt the proposed Table III(a).

Conversion

Most commenters to the notice of proposed rulemaking (NPRM) supported the concept of permitting labeling of brake hoses and end fittings in metric units. A number of commenters, however, expressed concerns about specific aspects of the proposal.

Several commenters specifically addressed the issue of conversions from metric to English units or English to metric units. General Motors (GM) stated that while the preamble of the NPRM indicated that metric units of any size would be allowed, the actual text proposed for the amended standard used only integer units. GM stated that this approach appeared to discourage soft conversions. (A soft conversion is an exact conversion, which tends to result in noninteger units, e.g., 1/2 inch = 12.7 mm. By contrast, a hard conversion involves rounding off to an integer, e.g., 1/2 inch = 13 mm.) GM stated that soft conversions may be the best interim approach to export products and to increase understanding of metrics in this country. GM suggested that the easiest way to specify the size-related requirements of the standard, without discouraging soft conversions, would be to establish requirements for a continuum of metric sizes. Eaton commented that the proposed amendment should specify that a manufacturer wishing to label a 1/2-inch-outside-diameter (O.D.) tube metrically should label this hose "12.7 mm (1/2 in) O.D." and not "12 mm O.D." Ford interpreted the notice as allowing manufacturers the option of labeling brake hoses in either metric or English unit sizes.

Several commenters emphasized that only soft conversions should be permitted, unless and until industry agrees on hard metric numbers. The Rubber Manufacturers Association (RMA) stated that a 1/4 inch-hose should be marked either 1/4 inch or 6.4 millimeters until such time as a hose in hard metric dimensions is produced. Stratoflex stated that United States manufacturers have made great progress in encouraging the international industrial community to standardize on inch-size hoses and that it should not be assumed that there is any need for the domestic industry to develop a line of hoses with whole metric dimensions.

Other commenters also addressed issues related to conversions. Several commenters emphasized that inch-size fittings must not be used with metric-size hose, since a mismatch could reduce performance and result in accidents. Goodyear objected to hard conversions of hose sizes because this would encourage the use of English-sized fittings with metric-sized hoses (and vice versa) which could lead to coupling-compatibility problems.

In response to the comments on conversions, the agency reiterates that NHTSA did not intend to encourage conversions of either inch-size or metric-size hose or fittings. The agency primarily contemplated that hoses that were manufactured in inch-size units would be labeled in inches, and hoses that were manufactured in integer metric units would be labeled in metric units. The agency intended to allow the use of metric-sized brake hoses in the American market, using the appropriate metric size labeling to denote the "as manufactured" size.

It should be noted, however, that with the exception of air brake hose intended for use with reusable end fittings, Standard No. 106 does not currently limit the sizes or specify the dimensional tolerances of brake hose. While the standard does specify some requirements and test conditions in terms of specific sizes, the standard does not prohibit sizes other than those listed, except for air brake hose intended for use with reusable end fittings. Apart from the above exception, manufacturers are not limited to the hose sizes listed in the standard. They may produce sizes of brake hose other than those listed. The test values for such sizes would be provided by reference to the nearest appropriate size that is listed in the standard.

Industry has voluntarily standardized the sizes and dimensional tolerances of inch size brake hose and fittings, primarily through the auspices of the Society of Automotive Engineers (SAE). It is critical that a hose or fitting marked with an inch size correspond dimensionally to accepted industry practice. A conversion of a metric-size hose to an inch size that resulted in labeling outside the scope of accepted industry dimensional practice, such as by hard conversions (i.e., rounding off) might well constitute a safety defect, since a mismatch could result in serious accidents due to brake hose assembly failure. It is particularly important in the case of air brake tubing and fittings, since these are often assembled in repair shops rather than in factories where there usually exists more control over the matching of hoses and fittings.

Since Standard No. 106 does not limit the sizes of most types of brake hose, manufacturers are not currently prohibited from using standard metric-sized hose if they label the hose sizes in inches. It should be emphasized, however, that in proposing the amendment, the agency did not intend to encourage conversions of any sort.

The same analysis discussed above applies to converting inch sizes to metric sizes. The agency did not intend to encourage these types of conversions when the amendment was proposed. However, if manufacturers choose to make conversions of inch sizes into metric sizes, the conversions should be within the scope of accepted dimensional practice of the international industry.

Mismatch Problems

Stratoflex expressed concern that the existence in the same marketplace of both inch- and metric-size hose and fittings could result in mismatch problems. That comment was specifically directed toward air brake tubing. Stratoflex's concern addressed the definition in Standard No. 106 of "permanently attached end fitting," which includes hose fittings which use sacrificial sleeves. Stratoflex stated that air brake tubing assemblies are often assembled in repair shops by mechanics who insert a fitting into a nylon tube and use an ordinary wrench to deform a sacrificial sleeve about the outside diameter of the tube to make the connection. Stratoflex stated that mechanics cannot be expected to know the difference between inch and metric fittings when neither fitting is marked for "size and type control." That commenter stated that the agency should either require inch-size air brake tubing only, set a date to require metric-size air brake tubing only, or establish additional marking rules for tubing and tube fittings and dimensional control for both inch- and metric-size tubing.

Stratoflex is correct that the standard's definition of "permanently attached end fitting" includes end fittings that are attached by use of a sacrificial sleeve. It is this type of fitting that is typically used for air brake tubing. That commenter is incorrect, however, in stating that these fittings need not be marked for size. Section S7.2.2 of Standard No. 106 requires that end fittings must be labeled as to size except for end fittings attached by deformation of the fitting about a hose by crimping or swaging. Crimping or swaging is a process that is done by the manufacturer of the hose during the assembly of a hose. It does not include using a wrench to deform a sacrificial sleeve around tubing. This latter type of fitting (i.e., utilizing a sacrificial sleeve) would be required to be marked as to size.

Stratoflex stated that the agency should establish additional marking rules for dimensional control for both inch and metric tubing as currently required by Table III of the standard. Table III specifies precise dimensions for two nearly identical reusable air brake hoses and fittings. They are required to be specifically marked as Type AI or AII, in order to differentiate between these air brake assembly components in the field. While type control is relevant for reusable air brake hose, the agency is not aware of the existence of different types or sizes of air brake tubing that would necessitate special marking requirements.

It appears that Stratoflex may be referring to the question of whether a hose is inch or metric size. While the April 1982 NPRM proposed permitting labeling in either metric units or inches, the proposed language said that the hose could be labeled metrically but it did not specifically require that the unit of measurement be identified. In any event, the agency believes that Stratoflex's concerns about labeling are reasonable, and the final rule accordingly requires that metric labeling include the abbreviation "mm" to designate that the labeled units are metric.

The agency does not agree that this amendment permitting the use of metric-sized brake hoses will result in mismatch problems. Section 7.2.2 of Standard No. 106 currently requires at least one component of each air brake hose end fitting (except for end fittings that are attached by crimping or swaging) to be labeled with information which includes the nominal inside diameter of the hose to which the fitting is properly attached, or the outside diameter of the plastic tubing to which the fitting is properly attached. Section 9.1.2 requires at least one component of each vacuum brake hose fitting (except for end fittings that are attached by heat shrinking, interference fit with plastic vacuum hose, or crimping and swaging) to be labeled in a similar manner. These labeling requirements are not specified for hydraulic brake hose assemblies because section 5.1 of the standard requires each hydraulic brake hose assembly to have end fittings which are permanently attached by crimping or swaging. This final rule allows the end fittings to be labeled metrically, and the information provided on the end fittings to be expressed metrically. Since all hoses and end fittings that are assembled by mechanics will be labeled in inch or metric units, assemblers should have no difficulty in correctly matching hoses and end fittings.

Table III(a)

The agency has decided not to adopt the proposed Table III(a) in this final rule. Table III(a) specified physical dimensions for metric sizes of air brake tubing intended for use with reusable end fittings. Since the time of the proposal of Table III(a), however, the industry has moved to standardize on the sizes of air brake tubing labeled in metric units. Dimensional requirements for metric-sized air brake tubing has been specified by the SAE in Standard J1394 (April 1983). These specifications are equivalent to those proposed in Table III(a) by NHTSA. Similarly, the International Standards Organization (ISO) has moved towards the development of specifications for metric-sized air brake tubing in its draft form of TC22-SC2-WG1-173(e). Since the industry has moved to voluntarily standardize on sizes of metrically labeled brake tubing, the agency has decided it is unnecessary to specify dimensional requirements for air brake tubing at this time.

Tables IV, V, VI

Table IV of Standard No. 106 specifies test cylinder radii for air brake hoses of varying diameters. Hoses must not show visible cracks as a result of exposure to various test conditions, such as low temperatures, when bent around the test cylinder. Table V lists test requirements for high and low temperature resistance, bend, and deformation tests for vacuum brake hose, specifying the test values for different sizes of hose. Table VI provides test specimen dimensions and feeler gage dimensions for the deformation test for vacuum brake hoses. Presently the sizes of brake hoses referenced in these tables are in inch-size units. The amendment would provide the test values for specified sizes of metric-sized brake hoses as well as for the inch-size hoses.

Several commenters addressed the changes in Tables IV, V, and VI, proposed in the NPRM. Stratoflex suggested changes in the millimeter sizes referenced in Table IV and requested the table's column heading be changed to read "Nominal inside hose diameter in inches (millimeters)." The requirements of Table IV were previously specified on the basis of the inside diameter of the hose. However, in February 1974 (39 FR 7428), the agency revised the table to read "Hose, nominal diameter in inches." Since nominal diameter of traditional rubber hose refers to internal diameter and nominal diameter of tubing refers to outside diameter, the revision was made to include outside dimensions. In light of this revision, the agency does not find reason to change this column heading as suggested by this commenter.

Stratoflex also suggested deleting references to 5-, 8-, 10-, and 16-millimeter sizes in Tables V and VI, or adding these sizes to Table III(a). This suggestion was made in order to "maintain consistency in the document." In response to this comment, the agency notes that Table III(a) was proposed for sizes of metric air brake tubing, while Tables V and VI reference metric vacuum brake hose sizes. These metric sizes represent the sizes of metric brake hoses "as manufactured," and include all the sizes of metric brake hoses currently in use. Since the metric sizes listed in the tables are not conversions but instead represent actual sizes of metric hose presently manufactured, the various metric sizes proposed in Table III(a) for air brake tubing and in Tables V and VI for vacuum brake tubing would not be identical.

The RMA commented that the metric units referenced in Tables IV and V of the NPRM imply hard conversions of the inch dimensions. The commenter stated that hard conversions have not been adopted by the industry. The agency reiterates that the metric sizes referenced in the tables were not intended to represent conversions of inch-size hose, but were included in the tables for brake hose manufactured in metric sizes. The metric sizes listed in the tables represent all metric-sized brake hose currently being manufactured in the international industry. By referencing these sizes in the tables, the agency intended to provide the test values for these specific sizes of metric-sized brake hoses.

In order to avoid any appearance that metric values inserted in the tables constitute conversions, the agency has revised the proposed tables. Separate columns or rows are provided for inch-size hoses and metric-size hoses.

American Motors Corporation noted a mixture of dimensional systems in Tables I through IV, and suggested referencing the Systeme International d'Unites (SI) system for labeling brake hose at all applicable places in these tables. The agency interprets this comment to suggest using base units of the SI system in the standard. This approach would be impractical as the base unit of SI, for length is the meter. NHTSA believes that the use of the derived SI unit, the millimeter, will result in a comprehensible and uniform system of measurement.

Test Requirements

Eaton commented that a 6-mm O.D. tube it tested that was coupled with a metric fitting did not meet the 50-pound tensile load requirement of S7.3.10. The commenter expressed concern whether the current performance criteria of the standard could be directly applicable to the metric sizes specified in Table III(a). The agency sees no reason why a metric-size hose would not pass the same requirements as for an inch-size hose of similar dimensions, and has concluded that no changes need be made to these requirements for the metric-size hoses referenced in the final rule.

Eaton commented that S7.3.10 should reference "9 mm" instead of "10 mm" in paragraph 7.3.10 for the 150 pounds tensile requirement. Currently the tensile strength requirements of S7.3.10 specify that air brake hose assemblies with nominal internal diameters of 3/8 inch or 1/2 inch must withstand a pull of 150 pounds. The agency decided against requiring a brake hose with nominal internal diameter of 9 mm to withstand a 150-pounds tensile strength requirement because a hose of this size is less than 3/8 inch in nominal internal diameter. As announced in the NPRM, in proposing this amendment allowing the use of metric-sized brake hoses, the agency did not intend to change the performance criteria applicable to a particular size of hose. Therefore, hoses with nominal internal diameters less than 3/8 inch will continue to meet the 50-pounds test of S7.3.10.

Braid Reinforcement

Eaton raised the issue of air brake tubing construction. According to that commenter, nonmetallic air brake tubing manufactured in the United States which complies with Standard No. 106 also complies with the requirements of SAE Standard J844d. SAE J844d requires the use of fiber reinforcement in hose sizes 3/8 inch through 3/4 inch outside diameter. Eaton expressed concern that the ISO's draft proposal for Thermoplastic Tubing for Use in Air Brake Systems does not require the use of fiber reinforcement in the larger sizes of such hose, and suggested that the metric sizes of air brake hose also be required to comply with the SAE construction parameters. This amendment to Standard No. 106 does not require fiber reinforcement for these larger sizes of air brake tubing, since this final rule is limited to the issues raised by Saab-Scandia's petition. However, if in the future it becomes apparent that construction requirements for air brake tubing should be included in Standard No. 106, then the agency will address that issue at the proper time.

In consideration of the foregoing, Standard No. 106, *Brake Hoses*, 49 CFR Part 571.106, is amended to read as set forth below.

1. S5.2.2(d) is revised to read as follows:

(d) The nominal inside diameter of the hose expressed in inches or fractions of inches, or in millimeters followed by the abbreviation "mm."

2. In table 1, the column entitled "Hydraulic brake hose, inside diameter" is amended by revising the phrase "1/8 inch or less" to read "1/8 inch or 3 mm or less"; by adding the phrase "or 4 to 5 mm" after the phrase "3/16 inch"; and by revising the phrase "1/4 inch or more" to read "1/4 inch or 6 mm or more."

3. Table II is amended by revising the headings under the phrase "Slack, inches" to read: "1/8 inch or 3 mm hose or less" and "more than 1/8 inch or 3 mm hose."

4. S6.6.1(b) is revised to read as follows:

(b) Condition a cylinder in air at minus 40 °F for 70 hours, using a cylinder of 2 1/2 inches diameter for test of hose less than 1/8 inch or 3 mm, 3 inches for tests of 1/8 inch or 3 mm hose, 3 1/2 inches for tests of 3/16 and 1/4 inch hose or of 4 to 6 mm hose, and 4 inches for tests of hose greater than 1/4 inch or 6 mm in diameter.

5. S7.2.1(d) is revised to read as follows:

(d) The nominal inside diameter of the hose expressed in inches or fractions of inches or in millimeters, or the nominal outside diameter of plastic tubing expressed in inches or fractions of inches or in millimeters followed by the letters O.D. The abbreviation "mm" shall follow hose sizes that are expressed in millimeters. (Examples of inside diameter: 1/8, 1/2 [1/2SP in the case of 1/2 inch special air brake hose], 4 mm, 6 mm. Examples of outside diameter: 1/4 O.D., 12 mm O.D.)

6. S7.2.2(d) is revised to read as follows:

(d) The nominal inside diameter of the hose to which the fitting is properly attached expressed in inches or fractions of inches or in millimeters, or the outside diameter of the plastic tubing to which the fitting is properly attached expressed in inches or fractions of inches or in millimeters followed by the letters O.D. (See examples in S7.2.1(d).) The abbreviation "mm" shall follow hose sizes that are expressed in millimeters.

7. Table IV is revised to read:

TABLE IV. AIR BRAKE HOSE DIAMETERS AND TEST CYLINDER RADII

Nominal hose diameter, in.*	1/8	3/16	1/4	5/16	3/8,13/32	7/16, 1/2	5/8
mm.*	3	4,5	6	8	10	12	16
Radius of test cylinder in inches	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2

*These sizes are listed to provide test values for brake hoses manufactured in these sizes. They do not represent conversions.

8. S7.3.10 amended by revising the section to read:

S7.3.10 *Tensile strength.* An air brake hose assembly (other than a coiled nylon tube assembly which meets the requirements of §393.45 of this title) designed for use between frame and axle or between a towed and a towing vehicle shall withstand, without separation of the hose from its end fittings, a pull of 250 pounds if it is 1/4 inch or less or 6 mm or less in nominal internal diameter, or a pull of 325 pounds if it is larger than 1/4 inch or 6 mm in nominal internal diameter. An air brake hose assembly designed for use in any other application shall withstand, without separation of the hose from its end fitting, a pull of 50 pounds if it is 1/4 inch or 6 mm or less in nominal internal diameter, 150 pounds if it is 3/8 or 1/2 inch or 10 mm to 12 mm in nominal internal diameter, or 325 pounds if it is larger than 1/2 inch or 12 mm in nominal internal diameter (S8.9).

9. S7.3.11 is amended by revising the section to read:

S.7.3.11 *Water absorption and tensile strength.* After immersion in distilled water for 70 hours (S8.10), an air brake hose assembly (other than a coiled tube assembly which meets the requirements of §393.45 of this title) designed for use between frame and axle or between a towed and a towing vehicle shall withstand without separation of the hose from its end fittings a pull of 250 pounds if it is 1/4 inch or 6 mm or less in nominal internal diameter, or a pull of 325 pounds if it is larger than 1/4 inch or 6 mm in nominal internal diameter. After immersion in distilled water for 70 hours (S8.10), an air brake hose assembly designed for use in any other application shall withstand without separation of the hose from its end fitting a pull of 50 pounds if it is 1/4 inch or 6 mm or less in nominal internal diameter, 150 pounds if it is 3/8 inch or 1/2 inch or 10 to 12 mm in nominal internal diameter, or 325 pounds if it is larger than 1/2 inch or 12 mm in nominal internal diameter (S8.9).

10. S9.1.1(d) is revised to read as follows:

(d) The nominal inside diameter of the hose expressed in inches or fractions of inches or in millimeters, or the nominal outside diameter of plastic tubing expressed in inches or fractions of inches or in millimeters followed by the letters OD. The abbreviation "mm" shall follow hose sizes that are expressed in millimeters. (Example of inside diameter: 7/32, 1/4, 4 mm. Example of outside diameter: 1/4 O.D., 12 mm O.D.)

11. S9.1.2(d) is revised to read as follows:

(d) The nominal inside diameter of the hose to which the fitting is properly attached expressed in inches or fractions of inches or in millimeters, or the outside diameter of the plastic tubing to which the fitting is properly attached expressed in inches or fraction of inches or in millimeters followed by the letters O.D. (See examples in S9.1.1(d).) The abbreviation "mm" shall follow hose sizes that are expressed in millimeters.

12. In tables V and VI, column 1, referring to hose inside diameter is amended by changing it to read (note: columns after column 1 remain unchanged):

Issued on January 22, 1985.

Diane K. Steed
Administrator

50 FR 4688
February 1, 1985

TABLE V — VACUUM BRAKE HOSE TEST REQUIREMENTS

Hose Inside Diameter*		High Temp. Resistance		Low Temp. Resistance	
Inches	Millimeters	Hose Length, inches	Radius of Cylinder inches	Hose Length, inches	Radius of Cylinder inches
— 7/32	5 —	8	1 1/2	17 1/2	3
— 1/4	6 —	9	1 1/2	17 1/2	3
9/32	—	9	1 3/4	19	—
— 11/32	8 —	9	1 3/4	19	—
3/8 —	— 10	10	1 3/4	19	—
7/16	—	11	2	—	—
15/32	—	11	2	—	—
— 1/2	12 —	11	—	—	—
5/8 —	— 16	12	—	—	—
3/4	—	14	—	—	—
1	—	16	—	—	—

*These sizes are listed to provide test values for brake hoses manufactured in these sizes. They do not represent conversions.

TABLE VI—DIMENSIONS OF TEST SPECIMEN AND FEELER GAGE FOR DEFORMATION TEST

Hose inside diameter*		Specimen dimensions (see fig. 4)		Feeler gage dimensions	
In.	Mm.	Depth (inch)	Length (inch)	Width (inch)	Thickness (inch)
7/32	5	3/64	1	1/8	3/64
1/4	6	1/16	1	1/8	1/16
3/32	—	1/16	1	1/8	1/16
1 1/32	8	5/64	1	3/16	3/64
3/8	10	3/32	1	3/16	3/32
7/16	—	5/64	1	1/4	5/64
15/32	—	3/64	1	1/4	5/64
1/2	12	1/8	1	1/4	1/8
5/8	16	3/32	1	1/4	5/32
3/4	—	3/16	1	1/4	3/16
1	—	1/4	1	1/4	1/4

*These sizes are listed to provide test values for brake hoses manufactured in these sizes. They do not represent conversions.

PREAMBLE TO AN AMENDMENT TO
FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106

Brake Hoses

(Docket No. 82-02; Notice 3)

ACTION: Final rule.

SUMMARY: This notice amends the air brake hose adhesion test of Federal Motor Vehicle Safety Standard No. 106, *Brake Hoses.* The adhesion test is included in FMVSS No. 106 to assure that the various layers of an air brake hose do not separate in service. The test measures the force required to separate adjacent layers of a brake hose. This rule amends the standard to exclude the force levels recorded during the initial and final 20 percent of the testing from the calculation of adhesion value. The agency believes that those data should be excluded because they can be artificially influenced by variables other than the actual adhesion of the brake hose layers. This rule also changes the test apparatus used to measure adhesion value. The new apparatus, a tension-type machine, is more widely used by test laboratories than the pendulum-type apparatus currently referenced in the standard, and provides more valid and consistent data.

This rulemaking action commenced in response to a petition for rulemaking submitted by the B.F. Goodrich Company.

EFFECTIVE DATE: July 6, 1986. In addition, this rule provides for an optional immediate effective date.

SUPPLEMENTARY INFORMATION: On February 18, 1982, the agency published a notice (47 FR 7293) granting a petition for rulemaking submitted by the B.F. Goodrich Company (Goodrich) and requesting comments on the issues raised by the petition. Goodrich's petiton concerned technical changes to the adhesion test for air brake hoses set forth in Federal Motor Vehicle Safety Standard (FMVSS) No. 106, *Brake Hoses.* That company requested the agency to adopt two changes to the adhesion test: (1) that adhesion value, i.e., the force required to separate adjacent layers of a brake hose, be determined by an averaging technique rather than by the current method of using the minimum force recorded during the test; and, (2) that the force levels recorded in separating the layers of the brake hose at the beginning and end of the test be disregarded.

Comments were received on the advantages and disadvantages of specifying an average adhesion value and disregarding portions at the ends of the test chart. After considering those comments, the agency concluded that the current method of determining adhesion value by an absolute minimum value furthers the interests of safety. Accordingly, in a notice of proposed rulemaking (NPRM) issued in May 1985, NHTSA terminated further rulemaking as to that portion of Goodrich's petition requesting that an averaging technique be used. (50 FR 21090; May 22, 1985.) However, that notice also announced that the agency had tentatively determined that a portion of the test chart should be excluded from the calculation of adhesion value, and proposed to revise S8.6.4 to set this excluded portion at the first and last 20 percent of the adhesion test chart.

Testing Brake Hose Adhesion

The adhesion test is included in FMVSS No. 106 to ensure that the various layers of a brake hose do not separate in service. Low adhesion in brake hoses can result in the build-up of air between plies. The trapped air can cause inward ballooning of the hose, resulting in slow reaction of the brakes served, or a complete malfunction due to the hose conduit being blocked altogether.

The first step of the adhesion test procedure is to cut a specimen of brake hose, one inch or more in length. The specimen is then cut longitudinally along its entire length to the level of contact with a lower layer. The layer to be tested is peeled back along the longitudinal cut so as to create a flap large enough to be attached to a test apparatus. The test apparatus applies tension in a direction essentially perpendicular to the axis of the brake hose so as to separate, i.e., unroll, the layer being tested from the rest of the brake hose. A chart is produced which has inches of separation as one coordinate and applied tension as the other. Paragraph S7.3.7 requires that, except for hose reinforced by wire, an air brake hose must withstand a tensile force of eight pounds per inch of length before the adjacent layers separate. Paragraph S8.6.4 of the standard provides that adhesion value—i.e., the force required to separate adjacent layers of a brake hose—is "the minimum force recorded on the portion of the chart corresponding to the actual separation of the part being tested."

Disregarding Force Levels at Beginning and End of Test

Goodrich requested that the force levels recorded on the beginning and end of the test chart be disregarded because adhesion between layers might be disturbed during sample preparation, and because samples can distort near the end of the test, resulting in erratic values. The February 1982 notice requested comments on this issue. Several comments where received, all of which have been discussed in the May 1985 NPRM.

Most of the commenters agreed that an excluded area at each end of the test curve was necessary, but were divided as to how much of the chart should be disregarded. Porter and Aeroquip agreed with Goodrich that the beginning and end of the chart should be excluded because those portions are affected by variables resulting from sample preparation. Goodyear stated that the initial and final 20 or 25 percent of the test chart could be spurious because of distortion or mechanical effects, and believed that amending the standard to exclude those portions would be reasonable and acceptable. Midland Ross and Blue Bird commented that disregarding the beginning and end of the adhesion test chart has merit, but that 20 percent on either side was too much to exclude.

After considering those comments, the agency proposed a change to Standard No. 106 along the lines suggested by Goodrich. (50 FR at 21092.) NHTSA believed that an excluded area at each end of the test curve might be necessary because the end points on the test curve appeared to vary considerably depending on the sensitivity of the recording device and variation of sample preparation. A 20 percent exclusion zone was proposed since the agency believed that this area would not result in any safety problems and would cover the portions of the chart which were artificially influenced by variables other than the actual adhesion of the hose layers. This change was intended to ensure that the remaining portion of the test chart corresponds more accurately to the actual adhesion value of a brake hose specimen.

Goodyear was the only commenter to the NPRM. That company concurred with the proposed changes and reiterated its belief that the initial and final 20 or 25 percent of the adhesion test trace could be spurious because of distortion or mechanical effects, and should therefore be excluded.

This rule amends paragraph S8.6.4(a) of Standard No. 106 to specify that the actual separation of the part of the brake hose being tested shall be determined by excluding the protion of the chart which corresponds to the initial and final 20 percent of the separation distance along the chart's displacement axis. NHTSA has concluded that this excluded area would cover the portions of the chart which are artificially influenced by variables other than the actual adhesion of the hose layers, and that safety would not be negatively affected by this change.

As explained in the NPRM, each air brake hose tested for compliance with Standard No. 106 must meet the adhesion test requirement regardless of the specimen tested. Disregarding 20 percent at the beginning and end of the chart yields test results for 60 percent of the test specimen. This does not mean that 40 percent of the hose is not tested to the adhesion requirements of the standard. Multiple specimens of the brake hose can be oriented on the test apparatus so that test results for the entire circumference of the hose can be obtained. Several one inch long test specimens are usually cut from a single piece of hose. These additional samples are each individually cut axially in preparation for the adhesion test. Another hose specimen, adjacent to the original specimen, can be tested for compliance, with the cut made at a different point from the original. The portion of the air brake hose falling within the 40 percent range that was disregarded in the first test can thus be included in the portion of the hose tested for compliance in a subsequent test.

Test Apparatus

Paragraph S8.6.1 of FMVSS No. 106 currently references a pendulum type test apparatus in the adhesion test procedure. The NPRM proposed to reference a tension-type test apparatus in its place. The tension-type apparatus is commonly available and widely used in brake hose testing laboratories. This type of machine is a constant-speed, pulling device whose rate of pull can be set to the required in the standard. A load cell is utilized to measure the resistive load of the bonded layers of hose as they are separated by the machine.

Goodyear, the only commenter to the NPRM, concurred with this change. Since NHTSA believes that the tension-type apparatus is widely used and provides more valid and consistent data than the pendulum apparatus, this rule amends S8.6.1 as proposed.

Effective Date

These amendments are effective July 6, 1986. In addition, this rule provides for an optional immediate effective date. The agency finds good cause for an optional immediate effective date since the amendments clarify the method of calculating the actual adhesion value of a brake hose. Further, there is good cause for specifying an optional immediate effective date for use of the tension-type test apparatus since most, if not all, compliance testing is presently done on this machine. The alternative effective date of 180 days after publication of this rule in the *Federal Register* would provide adequate leadtime for any users presently testing with a pendulum or inclination balance type apparatus.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

S8.6.1 *Apparatus.*

A tension testing machine that is power-driven and that applies a constant rate of extension is used for measuring the force required to separate the layers of the test specimen. The apparatus is constructed so that:

(a) The recording head inlcudes a freely rotating form with an outside diameter substantially the same as the inside diameter of the hose specimen to be placed on it.

(b) The freely rotating form is mounted so that its axis of rotation is in the plane of the ply being separated from the specimen and so that the applied force is perpendicular to the tangent of the specimen circumference at the line of separation.

(c) The rate of travel of the power-actuated grip is a uniform one inch per minute and the capacity of the machine is such that maximum applied tension during the test is not more than 85 percent nor less than 15 percent of the machine's rated capacity.

(d) The machine produces a chart with separation as one coordinate and applied tension as the other.

S8.6.4(a) The adhesion value shall be the minimum force recorded on the chart excluding that portion of the chart which corresponds to the initial and final 20 percent portion along the displacement axis.

Issued on December 31, 1985

Diane K. Steed
Administrator

51 F.R. 603
January 7, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 106

Brake Hoses

(Docket No. 85-02; Notice 2)

ACTION: Final Rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 116, *Motor Vehicle Brake Fluids,* and FMVSS No. 106, *Brake Hoses,* to revise the referee materials and test procedures referenced in portions of those standards. FMVSS No. 116 and FMVSS No. 106 currently reference the referee material (RM) identified as RM-1 fluid by the Society of Automotive Engineers (SAE). However, RM-1 fluid is now commercially unavailable, and is less representative of brake fluids used in vehicles on the road today. The SAE in its January 1980 revision of Standard J1703, "Motor Vehicle Brake Fluid," substituted a new referee material, RM-66-03, in place of RM-1 for use in the J1703 compatibility test. This final rule adopts this revision and references RM-66-03 for use in the compatibility test of Standard No. 106, and the compatibility and fluid chemical stability tests of Standard No. 116. This notice also references a new referee material, TEGME, in the humidification procedure of Standard No. 116, adjusts the water content level and test temperature referenced in the test procedures, and amends the number of sets of stroking test materials in the stroking test procedures. This notice also makes procedural modifications to Standard No. 116's humidification procedure adopted from the SAE, and corrects the description of test procedures used to evaluate brake fluid stroking properties.

EFFECTIVE DATE: Due to the commercial unavailability of RM-1 fluid, this rule is effective May 6, 1986. However, because the agency is concerned that manufacturers who might still be using RM-1 fluid to test their products should be able to use their existing supplies, use of RM-1 fluid may continue until November 3, 1986.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard (FMVSS) No. 116, *Motor Vehicle Brake Fluids,* and FMVSS No. 106, *Brake Hoses,* specify performance requirements for motor vehicle brake fluids and brake hoses. Included in the performance requirements of Standard No. 106 is a brake fluid compatibility test, and included in Standard No. 116 are compatibility, chemical stability, and humidification tests. Referee materials are used to test specimens of brake hose and brake fluid for compliance with the standards' requirements. These materials provide a basis of comparison between the results of the tests and the specifications of the standards. The procedures for the compatibility, chemical stability, and humidification tests currently reference the referee material brake fluid specified by the Society of Automotive Engineers (SAE) in the April 1968 version of SAE Standard J1703b. Standard J1703b, in turn, references a referee material (RM) identified as RM-1. (Standard No. 116's description of SAE Standard J1703b, "Motor Vehicle Brake Fluid," April 1968, is incorrect in that the correct reference should be to J1703b, July 1970. In 1970, the agency proposed to reference test procedures of J1703a, April 1968, in Standard No. 116. Subsequently, NHTSA changed reference from J1703a to J1703b. The effort to make this change inadvertently resulted in showing April 1968, the date of J1703a, as the date of J1703b. This notice corrects the error by referencing J1703b, July 1970.)

This rule amends FMVSS Nos. 116 and 106 to revise the referee materials and test procedures referenced in portions of those standards. The SAE, in its January 1980 and November 1983 revisions of Standard J1703, "Motor Vehicle Brake Fluid," substituted a new referee material, RM-66-03, in place of RM-1 for use in the J1703 compatibility test. This notice adopts this revision and references RM-66-03 for use in the compatibility test of Standard No. 106, and the compatibility and fluid chemical stability tests of Standard No. 116. This notice also references a new referee material, TEGME, in the humidification procedures of Standard No. 116, adjusts the water content level and test temperature referenced in the test procedures, and amends the number of sets of stroking test materials in the stroking test of Standard No. 116. This notice also adopts SAE revisions to FMVSS No. 116's humidification test which had been inadvertently omitted from the amendatory language of the proposed rule, and corrects the description of test procedures used to evaluate brake fluid stroking properties.

Testing Brake Hose/Fluid Characteristics

Brake fluid compatibility is an important factor in establishing brake hose life and strength characterisitcs. The compatibility test of FMVSS No. 106 measures hydraulic brake hose compatibility with brake fluid. The brake hose test specimen is filled with the SAE Compatibility Fluid for a required number of hours at specified temperatures, and is then subjected to constriction and burst strength tests. Currently, RM-1 fluid is referenced in the test procedures for the standard's brake fluid compatibility test.

Under the compatibility requirements of FMVSS No. 116, the compatibiltiy of a brake fluid with an RM fluid is determined. The compatibility fluid that is used in these tests as a referee material should be representative of the fluids found in a braking system in service. The tests measure the compatibility of fluids of different chemical bases by checking whether there are undesirable chemical interactions resulting from the mixture of fluids. Paragraph S6.10 sets out the procedures for evaluating the compatibility of a brake fluid with other liquids used in a hydraulic brake system (i.e., other brake fluids). This section currently references RM-1 fluid as the referee material used in that test procedure.

The humidification tests of FMVSS No. 116 measure the amount of water absorbed by a brake fluid as compared to a reference fluid. The presence of water in a brake system degrades braking performance and safety by lowering the boiling point of brake fluid, increasing the possibility of vapor lock and the corroding of system components, and the depositing of sediment in wheel cylinders that could cause a system malfunction.

Standard No. 116 establishes minimum wet equilibrium reflux boiling points (ERBP's) for different grades of brake fluid, and the test procedures of S6.2 determine the water content and wet ERBP of brake fluid specimens. The current test procedure specifies that sample fluids of RM-1 and the test specimen are to be humidified simultaneously under controlled conditions. The SAE RM-1 fluid is used as the reference fluid that establishes the "endpoint" for humidification. When the water content of the RM-1 fluid is measured to be 3.50 ± 0.05 percent by weight, the test fluid sample is removed from the humidification apparatus. After humidification, the water and ERBP of the sample are determined.

Section 7.2 of FMVSS No. 116 also refers to RM-1 fluid as a reference for measuring the water content of brake fluids.

RM-66-03 Fluid

A notice of proposed rulemaking (NPRM) on this rulemaking action was published on March 7, 1985 (50 FR 9294). The NPRM explained that FMVSS Nos. 106 and 116 currently reference SAE RM-1 Compatibility Fluid in their test procedures. In that notice, the agency announced its tentative finding that the inclusion of RM-1 fluid is no longer desirable for the following reasons.

The agency stated its belief that reference to RM-1 fluid should be changed because manufacture of the fluid has ceased. A new fluid, identified as RM-66-03 Compatibility Fluid, has replaced the RM-1 fluid in test procedures described in the January 1980 and November 1983 revisions of SAE Standard J1703. This new fluid is described by the SAE as a blend of four proprietary polyglycol brake fluids of fixed composition, in equal parts by volume. The four fluids selected comprise three factory-fill and one after-market fluid as follows: DOW HD50-4, DOW 455, Delco Supreme II, and Olin HDS-79.

While RM-1 fluid is not readily available, RM-66-03 fluid is available from the SAE in the blend and formulation developed by the SAE for J1703. The indiviual manufacturers of the four proprietary fluids have indicated to the SAE Brake

Fluids Subcommittee and Reference Materials Subcommittee that the proprietary formulation might be changed in the commercial market, but that the formulations developed for the RM-66-03 fluid would be guaranteed to be available for a minimum five-year period commencing May 1983, i.e., at least until May 1988.

The updated reference to RM-66-03 fluid by the SAE is a result of the termination of the manufacturing of the RM-1 fluid. Several of the ingredients contained in the RM-1 fluid are not available to fluid manufacturers since the materials are no longer used in today's fluids, or have become prohibitively costly to obtain. As a result, manufacturers are unwilling to produce more RM-1 fluid.

In addition, RM-1 fluid is not representative of fluids in service today. The agency stated its belief that revising the referee material used in the compatibility test is warranted since the purposes of that test would be better served by a referee material more representative of today's fluids. Inclusion of RM-1 fluid in FMVSS Nos. 116 and 106 is also undesirable because RM-1 fluid contains toxic materials which require elaborate protective procedures and special handling and manufacturing processes.

In consideration of the foregoing, NHTSA proposed an amendment to FMVSS Nos. 106 and 116 to substitute new referee materials for the compatibility and humidification tests. For Standard No. 106's compatibility requirement and test procedures (S5.3.9 and S6.7), and Standard No. 116's compatibility (6.10), fluid chemical stability (6.5), and water content (7.2) tests, the new referee material was proposed to be RM-66-03 fluid as described in the January 1980 version of SAE Standard J1703.

Seven commenters responded to the NPRM. Each commenter agreed with the proposal to reference RM-66-03 fluid in FMVSS Nos. 106 and 116. General Motors Corporation (GM) and Chrysler Corporation agreed with the agency's tentative conclusion that the new referee material would be more available and compatible with current brake fluids than RM-1 fluid. Other commenters believed that the change would be practical and reasonable.

NHTSA has considered the comments to the NPRM and has decided to amend FMVSS Nos. 106 and 116 to reference RM-66-03 compatibility fluid. One slight change has been made to the NPRM's proposal. The NPRM proposed to reference the RM-66-03 fluid as described in the January 1980 revision of SAE Standard J1703. This rule will reference RM-66-03 fluid as described in the November 1983 revision of J1703. The two SAE revisions of J1703 are identical in their descriptions of RM-66-03; the agency is making this change in order to keep FMVSS Nos. 106 and 116 current by referencing the more recent SAE standard.

Use of the RM-66-03 fluid in the test procedures of Standards Nos. 116 and 106 should have a beneficial impact on safety. Since the RM-1 compatibility fluid currently referenced in FMVSS Nos. 106 and 116 is not commercially available, ascertaining whether hoses and fluids comply with certain requirements related to compatibility and boiling points is difficult. Amending the standards to allow the use of RM-66-03 fluid in place of RM-1 provides a readily available compatibility fluid for the compliance tests which is more representative of fluids used in today's vehicles.

TEGME, Brake Fluid Grade

In humidification test procedures under FMVSS No. 116, the referee material fluid is used as a reference to determine when to terminate the humidification procedure. Currently, RM-1 fluid is used as this referee material. NHTSA proposed to amend Standard No. 116 to reference a new referee fluid, triethylene glycol monomethyl ether (TEGME), brake fluid grade, as the referee material noted in Standard No. 116's procedures for a brake fluid's wet equilibrium reflux boiling point (S6.2). TEGME has been referenced by the SAE in J1703, January 1980, and J1703, November 1983, as the referee material used in the humidification test procedure.

In addition to referencing the TEGME material, the agency also proposed to amend S6.2 of FMVSS No. 116 to adjust the final water content of the referee material fluid to 3.70% water (instead of the current requirement of 3.5%), change the test temperature to 50°C. (from 23°C.), and add a cooling period for the sealed jar sample. As explained in the NPRM, those changes (use of TEGME fluid, change in water pickup and test temperature, and the cool-down to room temperature) were proposed as part of the overall changes adopted from SAE J1703 procedures.

All but one of the commenters to the notice supported the changes to the TEGME fluid. Commenters believed that the changes would simplify the test procedures and make them more cost effective.

In its comment on the NPRM, Union Carbide questioned whether there are adequate data to show that the new humidification test procedure will produce comparable test results when applied to DOT-4 and DOT-5 brake fluids. That commenter suggested that NHTSA reconsider adopting the SAE J1703, January 1980 humidification test method or adopt it as an alternative to the current method that uses RM-1 fluid until complete comparative testing could be performed.

The agency does not agree with Union Carbide that the humidification test method of SAE J1703, January 1980 should not be adopted as the new Standard No. 116 test procedure. The TEGME fluid is capable of absorbing a measurable amount of water in a given time and is only used as a reference to determine when to terminate the humidification process. Under the humidification test procedure, samples of brake fluid and TEGME are humidified simultaneously until a measured quantity of fluid is picked up in the TEGME. When the water content of the TEGME fluid reaches 3.7 percent, the brake fluid test specimens are removed from the test apparatus and their water contents and ERBP's are measured. TEGME, the referee material used in the humidification procedure, thus serves only to establish the end point of a test procedure.

The 3.7 percent TEGME water pickup (at 50°C) corresponds to the 3.5 percent water pickup (at 23°C) of the referee fluid (RM-1) used previously to determine the end point of the humidification procedure. The agency has determined that DOT-3 fluid picks up the same amount of water when humidified under procedures which use TEGME as the referee material as it does when humidified under procedures using RM-1. Therefore, the agency believes that the water pickup of test fluids, including DOT-4 and DOT-5 fluids, would not be affected by the change to TEGME. Accordingly, NHTSA is amending FMVSS No. 116 to reference the TEGME referee material.

The NPRM proposed to reference the TEGME fluid as described in the January 1980 revision of Standard J1703. This rule will instead reference TEGME as described in the November 1983 revision of J1703. The two SAE revisions of J1703 are identical in their descriptions of TEGME; the agency is making this change in order to keep FMVSS No. 116 current by referencing the more recent SAE standard.

Humidification Test Procedures

All commenters supported the additional changes to the humidification procedure of S6.2 adopted from SAE Standard J1703. This rule adopts the proposed changes to S6.2 and adjusts the final water content of the referee material fluid to 3.70%, changes the test temperature to 50°C, and adds a cooling period for the sealed jar sample.

Other changes to the humidification procedure were suggested in the comments to the NPRM. GM and Union Carbide Corporation pointed out that while NHTSA proposed to adopt the humidification test procedures from SAE J1703, the procedural modifications proposed in the amendatory language differed slightly from the SAE standard. GM suggested changing FMVSS No. 116's humidification procedure to agree with that of SAE J1703, January 1980 in order to facilitate testing. The following changes were suggested: S6.2.1 should be revised to require 150 ml. samples of brake fluid and TEGME instead of the proposed 100 ml. samples; S6.2.3 should be revised to eliminate ammonium sulfate from the list of reagents and materials and to specify distilled water and TEGME; S6.2.4 should be revised to load the dessicators with 450 ml. of distilled water instead of the ammonium sulfate/distilled water slurry; and S6.2.5 should be revised to use 150 ml. samples of the brake fluid and TEGME instead of the proposed 100 ml. samples.

As evidenced by the GM and Union Carbide comments, it was clear that the agency intended to facilitate testing by adopting the overall changes to the humidification test from SAE J1703. Therefore, NHTSA agrees that those additional changes should be incorporated into this final rule. This rule amends S6.2.1, S6.2.3, S6.2.4 and S6.2.5 to correct the minor omissions noted above. Further, S6.2.2 is revised to clarify that distilled water would be substituted for the salt slurry in Figure 3 of FMVSS No. 116, *Humidification Apparatus,* when TEGME is used as the referee material.

Stroking Test

The stroking test in FMVSS No. 116 checks the lubricity effect of a brake fluid on rubber components. The NPRM explained that the SAE had determined, in its revision of J1703, January 1980, that three sets of test material are sufficient to analyze the adequacy of test results. The notice announced that, based on NHTSA's tentative agreement with that SAE conclusion and its belief that compliance testing costs would be reduced by that change without an adverse affect on safety, the agency was proposing to amend the requirements of S5.1.13 and S6.13 to require testing of only three sets of test material (consisting of wheel cylinders, drums, shoe assemblies, etc.) instead of four sets, and eight new brake cups instead of 10. Since NHTSA proposed to reduce the number of cups tested, a reduction in the number of cups checked for unsatisfactory operating condition was also proposed.

All comments supported the agency's proposal to revise the stroking test procedures. The commenters believed that the changes proposed in the NPRM would simplify the test procedures and make them more cost effective. NHTSA agrees, and has revised S5.1.13 and S6.13 as proposed in the NPRM.

In addition, this rule makes several changes to the stroking test procedures in FMVSS No. 116 which directly relate to the agency's adoption of the SAE stroking test revision. Currently, S6.13.2 describes the apparatus and equipment used for the stroking test and refers to figures in SAE Standard J1703b which depict stroking apparatuses. Figure 1 of J1703b depicts four sets of drum and shoe assemblies. Since NHTSA has reduced the number of sets of test materials to three, the agency believes that the description of the test apparatuses and arrangement of test materials should also be revised to reflect this change. The description of the apparatuses used in the stroking test is changed only to clarify that three sets of materials are used, instead of four.

The following related revisions to the stroking test procedure are necessary to facilitate the change to three sets of materials. Paragraph S6.13.4(c) describes the preparation and assembly of test apparatuses. When a shoe and drum type apparatus is used, S6.13.4(c) specifies a 23 mm. stroke length, based on output piston movement of four sets of wheel cylinders. Stroke length refers to the distance traveled by the master cylinder piston to displace a certain volume of fluid in the test system which, in turn, forces the wheel cylinder pistons to travel a specified distance. Since the stroking test is revised to require only three sets of materials, the stroke length of the master cylinder would no longer be 23 mm.

This rule deletes reference in S6.13.4(c) to exact piston displacement measurements and a 23 mm. stroke length. The agency has determined that it is not necessary to specify master cylinder and wheel cylinder piston travel since those values are determined by the characteristics of the system which are specified in the standard (i.e., dimensions of the master cylinder and wheel cylinders, and pressure). The stroking test apparatus is a closed hydraulic system; pressure of 1000 pounds per square inch (psi) is generated at the outlet port of the master cylinder, and all pistons have the same diameters of $1^1/_8$ inch. Given the above, displacement of the wheel cylinders is directly proportional to the displacement of the master cylinder, and in the given test apparatus the stroke length of the master cylinder is dependent on system pressure. Stroke length would therefore be adjusted by the characteristics of the system from the former value of 23 mm. to a value proportioned for three wheel cylinders.

Since the agency is eliminating exact wheel cylinder piston travel measurements and is specifying that only three sets of test materials are required in the stroking test, this rule also deletes reference in S6.13.4(c) to Figure 4 of SAE Standard J1703b. That figure illustrated the approximate pressure buildup versus the master cylinder piston movement, and was based on the use of four sets of materials. S6.13.4(c) would continue, however, to specify that the pressure buildup is relatively low during the first part of the stroke, in order to avoid damage of the master cylinder's primary cup by ensuring that the primary cup passes the compensating port at a relatively low pressure.

Typographical Errors

This notice corrects the typographical errors in S5.1.9(a), S5.1.9(b) and S5.1.12 of Standard No. 116, as proposed in the NPRM.

Effective Date

This rule is effective May 6, 1986. As explained in the NPRM, the agency finds good cause for this expedited effective date because the RM-1 fluid used in the testing procedures of FMVSS Nos. 116 and 106 is commercially unavailable. Use of the RM-66-03 fluid will facilitate compliance testing by utilizing a referee material that is currently available and more representative of fluids in service. However, because the agency is concerned that manufacturers who might still be using RM-1 fluid to test their products should be able to use their existing supplies, use of RM-1 fluid may continue until October 26, 1986, i.e., 180 days after publication of this rule.

In accordance with the above provision permitting the use of RM-1 during the interim period, this rule describes separate test procedures appropriate for use with RM-1 and for the new referee materials (i.e., RM-6603 and TEGME). Test procedures for RM-1 usage are specified for those manufacturers who choose to use that fluid during the 180-day period.

Economic Effects

NHTSA has concluded that this final rule does not qualify as a "major rule" within the meaning of Executive Order 12291, and that it is not "significant" within the meaning of the Department of Transportation's regulatory procedures. Preparation of a regulatory impact analysis is not necessary for this rulemaking. The agency has determined further that the effects of this rulemaking are minor and that a full regulatory evaluation is not warranted. The rule references referee materials in Standards Nos. 116 and 106 that are readily available to manufacturers of brake fluids and brake hoses.

The agency believes that manufacturers will benefit by the change to RM-66-03 fluid and TEGME fluid in FMVSS No. 116 and RM-66-03 fluid in FMVSS No. 106. The fluids are readily available whereas RM-1 is not, and are more representative of fluids in service today. The agency knows of no problems resulting from tests onducted with the RM-66-03 and TEGME fluids.

Some cost savings would be realized with this amendment. The utilization of RM-66-03 fluid will reduce the costs of fluids used in compliance testing without sacrificing adequate test results. For example, as cited in the NPRM, when last available, RM-1 fluid cost approximately $27.00 per quart. The cost of RM-66-03 fluid is approximately $8.00 per quart.

Cost savings will be realized by the use of the TEGME fluid in the humidification tests of FMVSS No. 116. The TEGME fluid costs approximately $3.30 per quart. Further, using the TEGME fluid in compliance testing would conserve the more expensive supply of RM-66-03 brake fluid material.

The change in the stroking test procedures will also result in some cost savings. The costs related to the quantities of materials tested will be reduced about 25 percent.

Any changes to Standard Nos. 106 and 116 referencing the RM-66-03 and TEGME fluids and reducing the number of test materials used in the stroking test will not significantly affect manufacturers of brake hoses and referee materials. These manufacturers may benefit from some cost savings resulting from the changes to the standards, but will not otherwise be significantly affected by this amendment.

In consideration of the foregoing, 49 CFR 571.06, *Brake Hoses,* is amended as follows:

1. S5.3.9 is revised to read as follows:

S5.3.9 *Brake Fluid Compatibility, Construction, and Burst Stength.* Except for brake hose assemblies designed for use with mineral or petroleum-based brake fluids, a hydraulic brake hose assembly shall meet the constriction requirement of S5.3.1 after having been subjected to a temperature of 200°F for 70 hours while filled with SAE RM-66-03 Compatibility Fluid, as described in Appendix A of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983 (S6.7). It shall then withstand water pressure of 4,000 psi for 2 minutes and thereafter shall not rupture at less than 5,000 psi (S6.2). (SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used in place of SAE RM-66-03 until November 3, 1986.

2. Paragraph S6.7.1(a) is revised to read as follows:

S6.7.1 *Preparation.*

(a) Attach a hose assembly below a 1-pint reservoir filled with 100 ml of SAE RM-66-03 Compatibility Fluid as shown in Figure 2. (SAE RM-1

Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used in place of SAE RM-66-03 until October 26, 1986.

* * * * * *

§ 571.116 [Amended]

In consideration of the foregoing, 49 CFR 571.116, *Motor Vehicle Brake Fluids,* is amended as follows:

1. S5.1.9 is revised to read as follows:

S5.1.9 *Water Tolerance.*

(a) *At low temperature.* When brake fluid is tested according to S6.9.3(a)—

(1) * * *

(b) At 60°C (140°F). When brake fluid is tested according to S6.9.3(b)—

(1) * * *

2. S5.1.12 is revised to read as follows:

S5.1.12 *Effects on cups.* When brake cups are subjected to brake fluid in accordance with S6.12—

* * * * * *

3. S5.1.13 is revised to read as follows:

S5.1.13 *Stroking properties.* When brake fluid is tested according to S6.13—

* * * * * *

(c) The average decrease in hardness of seven of the eight cups tested (six wheel cylinder and one master cylinder primary) shall not exceed 15 IRHD. Not more than one of the seven cups shall have a decrease in hardness greater than 17 IRHD;

(d) None of the eight cups shall be in an unsatisfactory operating condition as evidenced by stickiness, scuffing, blisters, cracking, chipping, or other change in shape from its original appearance;

(e) None of the eight cups shall show an increase in base diameter greater than 0.90 mm (0.035 inch):

(f) The average lip diameter set of the eight cups shall not be greater than 65 percent:

* * * * * *

4. S6 is revised to read as follows:

S6. *Test procedures.* Until October 26, 1986, SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used in place of TEGME and SAE RM-66-03 in the humidification (S6.2), chemical stability (S6.5.4), and compatibility (S6.10) test procedures, and as a referee material in S7.2.

* * * * * *

5. S6.2.1 is revised to read as follows:

S6.2.1 *Summary of the procedure.*

(a) *With TEGME:* Except as provided in paragraph S6.2.1(b), a 150 ml sample of the brake fluid is humidified under controlled conditions; 150 ml of SAE triethylene glycol monoethyl ether, brake fluid grade, referee material (TEGME) as described in Appendix E of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983, is used to establish the end point for humidification. After humidification the water content and ERBP of the brake fluid are determined.

(b) *With RM-1:* Until November 3, 1986, SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used with the following procedures. See S6. A 100-ml. sample of the brake fluid is humidified under controlled conditions: 100 ml of SAE RM-1 Compatibility Fluid is used to establish the end point for humidification. After humidification the water content and ERBP of the brake fluid are detemined.

6. S6.2.2 is revised to read as follows:

S6.2.2 *Apparatus for humidification.* (See Figure 3. Until October 26, 1986, a manufacturer may use either TEGME or RM-1 Compatibility Fluid. If TEGME is used, substitute 450 ml. of distilled water in place of the salt slurry and disregard the "45±7mm" dimension.)

Test apparatus shall consist of—

* * * * * *

7. S6.2.3 is revised to read as follows:

S6.2.3 *Reagents and Materials.*

(a) Distilled water, see S7.1.

(b) Except as provided in S6.2.3(c), SAE TEGME referee material.

(c) Until October 26, 1986, a manufacturer may use either TEGME or SAE RM-1 Compatibility Fluid. See S6.

(d) If RM-1 is used, also use ammonium sulfate $(NH_4)_2SO_4$, Reagent or A.C.S. grade.

8. S6.2.4 is revised to read as follows:

S6.2.4 *Preparation of Apparatus.*

(a) *With TEGME:* Except as provided in S6.2.4(b), lubricate the ground-glass joint of the desiccator. Pour 450±10 ml of distilled water into each desiccator and insert perforated porcelain desiccator plates. Place the desiccators in an oven with temperature controlled at 50±1°C (122±1.8°F) throughout the humidification procedure.

(b) *With RM-1:* Until October 26,1986, a manufacturer may use either TEGME or SAE RM-1 Compatibility Fluid. See S6. Lubricate the ground-glass joint of the desiccator. Load each desiccator with 450±25 grams of the ammonium sulfate and add 125±10 ml. of distilled water. The surface of the salt slurry shall lie within 45±7 mm. of the top surface of the desiccator plate. Place the desiccators in an area with temperature controlled at 23±2° C (73.4±3.6°F) throughout the humidification procedure. Condition the loaded desiccator with the covers on and stoppers in place at least 12 hours before use. Use a fresh charge of salt slurry for each test.

9. S6.2.5 is revised to read as follows:

S6.2.5 *Procedure.*

(a) *With TEGME:* Except as provided by S6.2.5(b), pour 150±5 ml of the brake fluid into an open corrosion test jar. Place the jar into a desiccator. Prepare in the same manner a duplicate test fluid sample and two duplicate specimens of the SAE TEGME referee material (150±5 ml of TEGME in each jar). The water content of the SAE TEGME fluid is adjusted to 0.50±0.05 percent by weight at the start of the test in accordance with S7:2. Place these samples in the dessicators in the 50°C (122°F) controlled oven and replace desiccator covers. At intervals, during oven humidification, remove the rubber stopper in the top of each desiccator containing SAE TEGME fluid. Using a long needled hypodermic syringe, take a sample of not more than 2 ml from each jar and determine its water content. Remove no more than 10 ml of fluid from each SAE TEGME sample during the humidification procedure. When the water content of the SAE fluid reaches 3.70± 0.05 percent by weight (average of the duplicates), remove the two test fluid specimens from their desiccators and promptly cap each jar tightly. Allow the sealed jars to cool for 60–90 minutes at 23±5°C (73.4±9°F). Measure the water contents of the test fluid specimens in accordance with S7.2 and determine their ERBP's in accordance with S6.1. If the two ERBP's agree within 4°C (8°F), average them to determine the wet ERBP: otherwise repeat and average the four individual ERBP's as the wet ERBP of the brake fluid.

(b) *With RM-1:* Until October 26, 1986, a manufacturer may use either TEGME or SAE RM-1 Compatibility Fluid. See S6. Pour 100±1 ml of the brake fluid into a corrosion test jar. Promptly place the jar into a desiccator. Prepare duplicate test sample, and two duplicate specimens of the SAE RM-1 Compatibililty Fluid. Adjust water content of the SAE RM-1 fluid to 0.50±0.05 percent by weight at the start of the test in accordance with S7.2. At intervals remove the rubber stopper in the top of each desiccator containing SAE RM-1 fluid. Using a long needled hypodermic syringe, take a sample of not more than, 2 ml from each jar and determine its water content. Remove no more than 10 ml of fluid from each SAE RM-1 sample during the humidification procedure. When the water content of the RM-1 fluid reaches 3.50±0.05 percent by weight (average of the duplicates), remove the two test fluid specimens from their desiccators and promptly cap each jar tightly. Measure the water contents of the test fluid specimens in accordance with S7.2 and determine their ERBP's in accordance with S6.1 through S6.1.5. If the two ERPB's agree within 4°C. (8°F.), average them to determine the wet ERBP; otherwise repeat and average the four individual ERBP's as the wet ERBP of the brake fluid.)

10. S6.5.4.1 is revised to read as follows:

S6.5.4.1 *Materials.*

(a) Except as provided in S6.5.4.1(b), SAE RM-66-03 Compatibility Fluid, as described in Appendix A of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983.

(b) Until October 26, 1986, a manufacturer may use either SAE RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970. See S6.

11. Paragraph S6.5.4.2 is revised to read as follows:

S6.5.4.2 *Procedure.*

(a) *With RM-66-03:* Except as provided in S6.5.4.2(b), mix 30±1 ml of the brake fluid with 30±1 ml of SAE RM-66-03 Compatibility Fluid in a boiling point flask (S6.1.2(a)). Determine the initial ERBP of the mixture by applying heat to the flask so that the fluid is refluxing in 10±2 minutes at a rate of excess of 1 drop per second, but not more than 5 drops per second. Note the maximum fluid temperature observed during the first minute after the fluid begins refluxing at a rate in excess of 1 drop per second. Over the next 15±1 minutes, adjust and maintain the reflux rate at 1 to 2 drops per second. Maintain this rate for an additional 2 minutes, recording the average value of four temperature readings taken at 30-second intervals as the final ERBP.

(b) *With RM-1:* Until October 26, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid, " July 1970. See S6.

(c) Thermometer and barometic corrections are not required.

12. S6.10.1 is revised to read as follows:

S6.10.1 *Summary of the procedure.*

(a) *With RM-66-03:* Except as provided in S6.10.1(b), brake fluid is mixed with an equal volume of SAE RM-66-03 Compatibility Fluid, then tested in the same way as for water tolerance (S6.9) except that the bubble flow time is not measured. This test is an indication of the compatibility of the test fluid with other motor vehicle brake fluids at both high and low temperatures.

(b) *With RM-1:* Until October 26, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b,"Motor Vehicle Brake Fluid," July 1970. See S6. This test is an indication of the compatibility of the test fluid with other motor vehicle brake fluids at both high and low temperatures.

13. Paragraph S6.10..2(e) is revised to read as follows:

S6.10.2 *Apparatus and materials.*

* * * * * *

(e) Except as provided in S6.10.2(f), *SAE RM-66-03 Compatibility Fluid.* As described in Appendix A of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983.

(f) Until October 26, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970. See S6.

14. Paragraph S6.10.3(a) is revised to read as follows:

S6.10.3 *Procedure.*

(a) *At low temperature.*

(1) *With RM-66-03:* Except as provided in S6.10.3(a)(2), mix 50±0.5 ml of brake fluid with 50±0.5 ml of SAE RM-66-03 Compatibility Fluid. Pour this mixture into a centrifuge tube and stopper with a clean dry cork. Place tube in the cold chamber maintained at minus 40±2°C (minus 40°±3.6°F). After 24±2 hours, remove tube, quickly wipe with a clean lint-free cloth saturated with ethanol (isopropanol when testing DOT 5 fluids) or acetone. Examine the test specimen for evidence of sludging, sedimentation, or crystallization. DOT 3 and DOT 4 test fluids shall also be examined for stratification.

(2) *With RM-1.* Until October 26, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970. See S6.

* * * * * *

15. S6.13.1 is revised to read as follows:

S6.13.1 *Summary of the procedure.* Brake fluid is stroked under controlled conditions at an elevated temperature in a simulated motor vehicle hydraulic braking system consisting of three slave wheel cylinders and an actuating master cylinder connected by steel tubing. Referee standard parts are used. All parts are carefully cleaned, examined, and certain measurements made immediately prior to assembly for test. During the test, temperature, rate of pressure rise, maximum pressure, and rate of stroking are specified and controlled. The system is examined periodically during stroking to assure that excessive leakage of fluid is not occurring. Afterwards, the system is torn down. Metal parts and SBR cups are examined and remeasured. The brake fluid and any resultant sludge and debris are collected, examined, and tested.

16. S6.13.2 is revised to read as follows:

S6.13.2 *Apparatus and equipment.*

Either the drum and shoe type of stroking apparatus (see Figure 1 of SAE Standard J1703b) except using only three sets of drum and shoe assemblies, or the stroking fixture type apparatus as shown in Figure 2 of SAE J1703, November 1983, with the components arranged as shown in Figure 1 of SAE J1703, November 1983. The following components are required.

(a) *Brake assemblies.* With the drum and shoe apparatus: three drum and shoe assembly units (SAE RM-29a) consisting of three forward brake shoes and three reverse brake shoes with linings and three front wheel brake drum assemblies with assembly component parts. With stroking fixture type apparatus: three fixture units including appropriate adapter mounting plates to hold brake wheel cylinder assemblies.

* * * * * *

(c) *Heated air bath cabinet.* An insulated cabinet or oven having sufficient capacity to house the three mounted brake assemblies or stroking fixture assemblies, master cylinder, and necessary connections. A thermostatically controlled heating system is required to maintain a temperature of 70° ± 5°C (158° ± 9°F) or 120° ± 5°C (248° ± 9°F). Heaters shall be shielded to prevent direct radiation to wheel or master cylinder.

* * * * * *

(f) *Wheel cylinder (WC) assemblies (SAE RM-14a).* Three unused cast iron housing straight bore hydraulic brake WC assemblies having diameters of approximately 28 mm ($1^1/_8$ inch) for each test. Pistons shall be made from unanodized SAE AA 2024 aluminum alloy.

* * * * * *

17. Paragraph S6.13.3(a) is revised to read as follows:

S6.13.3 *Materials.*

(a) *Standard SBP brake cups.* Six standard SAE SBR wheel cylinder test cups, one primary test cup, and one secondary MC test cup, all as described in S7.6, for each test.

* * * * * *

18. Paragraph S6.13.4(c) is revised to read as follows:

S6.13.4 *Preparation of test apparatus.*

* * * * * *

(c) *Assembly and adjustment of test apparatus.*

When using a shoe and drum type apparatus, adjust the brake shoe toe clearances to 1.0 ± 0.1 mm (0.040 ± 0.004 inch). Fill the system with brake fluid, bleeding all wheel cylinders and the pressure gage to remove entrapped air. Operate the actuator manually to apply a pressure greater than the required operating pressure and inspect the system for leaks. Adjust the actuator and/or pressure relief valve to obtain a pressure of 70 ± 3.5 kg./sq. cm. (1,000 ± 50 psi). A smooth pressure-stroke pattern is required when using a shoe and drum type apparatus. The pressure is relatively low during the first part of the stroke and then builds up smoothly to the maximum stroking pressure at the end of the stroke, to permit the primary cup to pass the compensating hole at a relatively low pressure. Using stroking fixtures, adjust the actuator and/or pressure relief valve to obtain a pressure of 70 ± 3.5 kg./sq. cm. (1,000 ± 50 psi).

Adjust the stroking rate to 1,000 ± 100 strokes per hour. Record the fluid level in the master cylinder standpipe.

19. S6.13.6(b) and S6.13.6(c) are revised to read as follows:

S6.13.6 *Calculation.*

* * * * * *

(b) Calculate the average decrease in hardness of the seven cups tested, as well as the individual values (see S5.1.13(c)).

(c) Calculate the increases in base diameters of the eight cups (see S5.1.13(e)).

20. The first sentence of Paragraph S6.13.6(d) is revised to read as follows:

(d) Calculate the lip diameter interference set for each of the eight cups by the following formula and average the eight values (see S5.1.13(f)).

* * * * * *

21. S7.2 is revised to read as follows:

S7.2 *Water content of motor vehicle brake fluids.* Use analytical methods based on ASTM D1123–59, "Standard Method of Test for Water in Concentrated Engine Antifreezes by the Iodine Reagent Method," for determining the water content of brake fluids, or other methods of analysis yielding comparable results. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM-66-03 and TEGME Compatibility Fluids within ± 15 percent of the water added for additions up to 0.8 percent by weight, and within ± 5 percent of the water added for additions greater than 0.8 percent by weight The SAE RM-66-03 Compatibility Fluid used to prepare the samples must have an original ERBP of not less than 205°C (401°F) when tested in accordance with S6.1. The SAE TEGME fluid used to prepare the samples must have an original ERBP of not less than 240°C (464°F) when tested in accordance with S6.1.

Until October 26, 1986, a manufacturer may use either RM-66-03 and TEGME or SAE RM-1 Compatibility Fluid. See S6. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM-1 Compatibility Fluid within ± 15 percent of the water added for additions up to 0.8 percent by weight, and within ± 5 percent of the water added for additions greater than 0.8 percent by weight. The SAE RM-1 Compatibility Fluid used to prepare the samples must have an original ERBP of not less than 182°C (360°F) when tested in accordance with S6.1.

Issued on April 29, 1986.

Diane K. Steed
Administrator

51 F.R. 16694
May 6, 1986

MOTOR VEHICLE SAFETY STANDARD NO. 106

Brake Hoses

S1. Scope. This standard specifies labeling and performance requirements for motor vehicle brake hose, brake hose assemblies, and brake hose end fittings.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries occurring as a result of brake system failure from pressure or vacuum loss due to hose or hose assembly rupture.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and to hydraulic, air, and vacuum brake hose, brake hose assemblies, and brake hose end fittings for use in those vehicles.

S4. Definitions.

"Armor" means protective material installed on a brake hose to increase the resistance of the hose or hose assembly to abrasion or impact damage.

"Brake hose" means a flexible conduit, other than a vacuum tubing connector, manufactured for use in a brake system to transmit or contain the fluid pressure or vacuum used to apply force to a vehicle's brakes.

"Brake hose assembly" means a brake hose, with or without armor, equipped with end fittings for use in a brake system, but does not include an air or vacuum assembly prepared by the owner or operator of a used vehicle, by his employee, or by a repair facility, for installation in that used vehicle.

"Brake hose end fitting" means a coupler, other than a clamp, designed for attachment to the end of a brake hose.

"Free length" means the linear measurement of hose exposed between the end fittings of a hose assembly in a straight position.

"Permanently attached end fitting" means an end fitting that is attached by deformation of the fitting about the hose by crimping or swaging, or an end fitting that is attached by use of a sacrificial sleeve or ferrule that requires replacement each time a hose assembly is rebuilt.

"Rupture" means any failure that results in separation of a brake hose from its end fitting or in leakage.

"Vacuum tubing connector" means a flexible conduit of vacuum that (i) connects metal tubing to metal tubing in a brake system, (ii) is attached without end fittings, and (iii) when installed, has an unsupported length less than the total length of those portions that cover the metal tubing.

For hose, a dimensional description such as "¼-inch hose" refers to the nominal inside diameter. For tubing, a dimensional description such as "¼-inch tubing" refers to the nominal outside diameter.

S5. Requirements—Hydraulic brake hose, brake hose assemblies, and brake hose end fittings.

S5.1 Construction. Each hydraulic brake hose assembly shall have permanently attached brake hose end fittings which are attached by deformation of the fitting about the hose by crimping or swaging.

S5.2 Labeling.

S5.2.1 Each hydraulic brake hose shall have at least two clearly identifiable stripes of at least one-sixteenth of an inch in width, placed on opposite sides of the brake hose parallel to its longitudinal axis. One stripe may be interrupted by the information required by S5.2.2, and the other stripe may be interrupted by additional information at the manufacturer's option. However, hydraulic brake hose manufactured for use only in an assembly whose end fittings prevent its installation in a twisted orientation in either side of the vehicle, need not meet the requirements of S5.2.1.

S5.2.2 Each hydraulic brake hose shall be labeled, or cut from bulk hose that is labeled, at intervals of not more than 6 inches, measured from the end of one legend to the beginning of the next, in block capital letters and numerals at least one-eighth of an inch high, with the information listed in paragraphs (a) through (e). the information need not be present on hose after it has become part of a brake hose assembly or after it has been installed in a motor vehicle.

(a) The symbol DOT, constituting a certification by the hose manufacturer that the hose conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of the hose, which shall be filed in writing with: Office of Crash Avoidance, Handling and Stability Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The marking may consist of a designation other than block capital letters required by S5.2.2.

(c) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example, 10/1/74 means October 1, 1974.

(d) [The nominal inside diameter of the hose expressed in inches or fractions of inches, or in millimeters followed by the abbreviation "mm." (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)]

(e) Either "HR" to indicate that the hose is regular expansion hydraulic hose or "HL" to indicate that the hose is low expansion hydraulic hose.

S5.2.3 "Reserved"

S5.2.4 Each hydraulic brake hose assembly, except those assembled and installed by a vehicle manufacturer in vehicles manufactured by him, shall be labeled by means of a band around the brake hose assembly as specified in this paragraph or, at the option of the manufacturer, by means of labeling as specified in S5.2.4.1. The band may at the manufacturer's option be attached so as to move freely along the length of the assembly, as long as it is retained by the end fittings. The band shall be etched, embossed, or stamped in block capitals letters, numerals, or symbols at least one-eighth of an inch hight with the following information:

(a) The symbol DOT constituting certification by the hose assembler that the hose assembly conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of the hose assembly, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

S5.2.4.1 At least one end fitting of a hydraulic brake hose assembly shall be etched, stamped, or embossed with a designation at least one-sixteenth of an inch high that identifies the manufacturing of the hose assembly and is filed in accordance with S5.2.4(b).

S5.3 Test requirements. A hydraulic brake hose assembly or appropriate part thereof shall be capable of meeting any of the requirements set forth under this heading, when tested under the conditions of S11 and the applicable procedures of S6. However, a particular hose assembly or appropriate part thereof need not meet further requirements after having been subjected to and having met the constriction requirement (S5.3.1) and any one of the requirements specified in S5.3.2 through S5.3.11.

S5.3.1 Constriction. Except for that part of an end fitting which does not contain hose, every inside diameter of any section of a hydraulic brake hose assembly shall be not less than 64 percent of the nominal inside diameter of the brake hose.

S5.3.2 Expansion and burst strength. The maximum expansion of a hydraulic brake hose assembly at 1,000 psi and 1,500 psi shall not exceed the values specified in Table I (S6.1).

The hydraulic brake hose assembly shall then withstand water pressure of 4,000 psi for 2 minutes without rupture, and shall not rupture at less than 5,000 psi (S6.2).

S5.3.3 Whip resistance. A hydraulic brake hose assembly shall not rupture when run continuously on a flexing machine for 35 hours (S6.3).

S5.3.4 Tensile strength. A hydraulic brake hose assembly shall withstand a pull of 325 pounds without separation of the hose from its end fittings (S6.4).

S5.3.5 Water absorption and burst strength. A hydraulic brake hose assembly, after immersion in water for 70 hours (S6.5), shall withstand water pressure of 4,000 psi for 2 minutes, and then shall not rupture at less than 5,000 psi (S6.2).

S5.3.6 Water absorption and tensile strength. A hydraulic brake hose assembly, after immersion in water for 70 hours (S6.5), shall withstand a pull of 325 pounds without separation of the hose from its end fittings (S6.4).

S5.3.7 Water absorption and whip resistance. A hydraulic brake hose assembly, after immersion in water for 70 hours (S6.5), shall not rupture when run continuously on a flexing machine for 35 hours (S6.3).

S5.3.8 Low-temperature resistance. A hydraulic brake hose conditioned at minus 40°F for 70 hours shall not show cracks visible without magnification when bent around a cylinder as specified in S6.6 (S6.6)

S5.3.9 Brake fluid compatibility, constriction, and burst strength. [Except for brake hose assemblies designed for use with mineral or petroleum-based brake fluids, a hydraulic brake hose assembly shall meet the constriction requirement of S5.3.1 after having been subjected to a temperature of 200°F for 70 hours while filled with SAE RM-66-03 *Compatibility Fluid,* as described in Appendix A of SAE Stnadard J1703, November 1983, *Motor Vehicle Brake Fluid,* November 1983 (S6.7). It shall then withstand water pressure of 4,000 psi for 2 minutes and thereafter shall not rupture at less than 5,000 psi (S6.2). (SAE RM-1 *Compatibility Fluid,* as described in Appendix A of SAE Standard J1703b, *Motor Vheicle Brake Fluid,* July 1970, may be used in place of SAE RM-66-03 until November 3, 1986. **(51 F.R. 16694—May 6, 1986. Effective: May 6, 1986)]**

5.3.10 Ozone resistance. A hydraulic brake hose shall not show cracks visible under 7-power magnification after exposure to ozone for 70 hours at 140°F (S6.8).

S5.3.11 End fitting corrosion resistance. After 24 hours of exposure to salt spray, a hydraulic brake hose end fitting shall show no base metal corrosion on the end fitting surface except where crimping or the application of labeling information has caused displacement of the protective coating (S6.9).

TABLE 1—Maximum Expansion of Free Length Brake Hose, cc/ft.

Hydraulic Brake Hose, inside diameter	Test Pressure			
	1,000 psi		1,500 psi	
	Regular Expansion Hose	Low Expansion Hose	Regular Expansion Hose	Low Expansion Hose
⅛ inch or 3 mm or less	0.66	0.33	0.79	0.42
³⁄₁₆ inch or 4 to 5 mm	0.86	0.55	1.02	0.72
¼ inch or 16 mm more	1.04	0.82	1.30	1.17

S6. Test procedures—Hydraulic brake hose, brake hose assemblies, and brake hose end fittings.

S6.1 Expansion test.

S6.1.1 Apparatus. Utilize a test apparatus (as shown in Figure 1) which consists of:

(a) Source for required fluid pressure;

(b) Test fluid of water without any additives and free of gases.

(c) Reservoir for test fluid;

(d) Pressure gauges;

(e) Brake hose end fittings in which to mount the hose vertically; and

(f) Graduated burette with 0.05 cc increments.

S6.1.2 Preparation.

(a) Measure the free length of the hose assembly.

(b) Mount the hose so that it is in a vertical straight position without tension when pressure is applied.

(c) Fill the hose with test fluid and bleed all gases from the system.

(d) Close the valve to the burette and apply 1,500 psi for 10 seconds; then release pressure.

S6.1.3 Calculation of expansion at 1,000 and 1,500 psi.

(a) Adjust the fluid level in the burette to zero.

(b) Close the valve to the burette, apply pressure at the rate of 15,000 psi per minute, and seal 1,000 psi in the hose (1,500 psi in second series).

(c) After 3 seconds open the valve to the burette for 10 seconds and allow the fluid in the expanded hose to rise into the burette.

(d) Repeat the procedure in steps (b) and (c) twice. Measure the amount of test fluid which has accumulated in the burette as a result of the three applications of pressure.

(e) Calculate the volumetric expansion per foot by dividing the total accumulated test fluid by 3 and further dividing by the free length of the hose in feet.

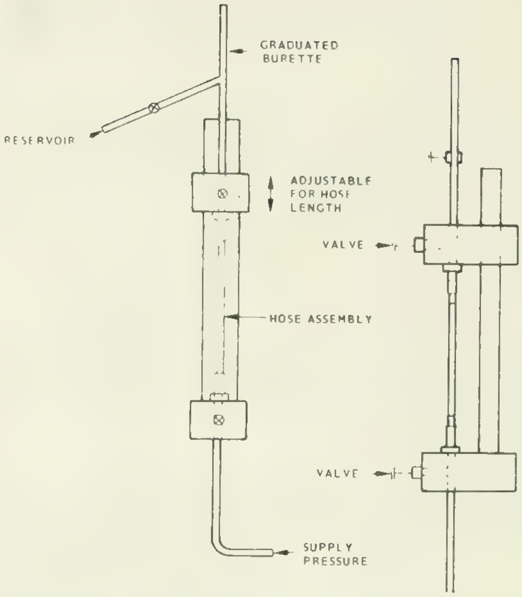

Fig. 1-Expansion Test Apparatus

S6.2 Burst strength test.

(a) Connect the brake hose to a pressure system and fill it completely with water, allowing all gases to escape.

(b) Apply water pressure of 4,000 psi at a rate of 15,000 psi per minute.

(c) After 2 minutes at 4,000 psi, increase the pressure at the rate of 15,000 psi per minute until the pressure exceeds 5,000 psi.

S6.3 Whip resistance test.

S6.3.1 Apparatus. Utilize test apparatus that is dynamically balanced and includes:

(a) A movable header consisting of a horizontal bar equipped with capped end fittings and mounted through bearings at each end to points 4 inches from the center of two vertically rotating disks whose edges are in the same vertical plane;

(b) An adjustable stationary header parallel to the movable header in the same horizontal plane as the centers of the disks, and fitted with open end fittings;

(c) An elapsed time indicator; and

(d) A source of water pressure connected to the open end fittings.

S6.3.2 Preparation.

(a) Remove all external appendages including, but not limited to, hose armor, chafing collars, mounting brackets, date bands and spring guards.

(b) Measure the hose free length.

(c) Mount the hose in the whip test machine introducing slack as specified in Table II for the size hose tested, measuring the projected length parallel to the axis of the rotating disks. The manufacturer may, at his option, adapt the fitting attachment points to permit mounting hose assemblies equipped with angled or other special fittings in the same orientation as hose assemblies equipped with straight fittings.

S6.3.3 Operation.

(a) Apply 235 psi water pressure and bleed all gases from the system.

(b) Drive the movable head at 800 rpm.

S6.4 Tensile strength test. Utilize a tension testing machine conforming to the requirements of the methods of Verification of Testing Machines (1964 American Society for Testing and Materials, Designation E4), and provided with a recording device to give the total pull in pounds.

S6.4.1 Preparation. Mount the hose assembly to ensure straight, evenly distributed machine pull.

S6.4.2 Operation. Apply tension at a rate of 1 inch per minute travel of the moving head until separation occurs.

S6.5 Water absorption sequence tests.

S6.5.1 Preparation. Prepare three hose assemblies as follows:

(a) Remove 1⅛ inches of hose cover, if any, from the center of the hose assemblies without injury to any reinforcing material or elongation of the hose assemblies.

(b) Measure the free length of the hose assemblies.

S6.5.2 Immersion and sequence testing.

(a) Immerse the hose assemblies in distilled water for 70 hours.

(b) Thirty minutes after removal from water, conduct tests S6.2, S6.3, and S6.4, using a different hose for each sequence.

S6.6 Low temperature resistance test.

S6.6.1 Preparation.

(a) Remove hose armor, if any, and condition a hose in a straight position in air at minus 40°F for 70 hours.

(b) Condition a cylinder in air at minus 40°F for 70 hours, using a cylinder of 2½ inches in diameter for test of hose less than ⅛-inch or 3 mm 3 inches for tests of ⅛-inch or 3 mm hose, 3½ inches for tests of 3/16-inch and ¼-inch hose or of 4 to 6 mm hose, and 4 inches for tests of hose greater than ¼ inch or 6 mm in diameter.

S6.6.2 Flexibility testing. Bend the conditioned hose 180 degrees around the conditioned cylinder at a steady rate in a period of 3 to 5 seconds. Examine without magnification for cracks.

S6.7 Brake fluid compatibility test.

S6.7.1 Preparation.

[(a) Attach a hose assembly below a 1-pint reservoir filled with 100 ml of SAE RM-66-03 *Compatibility Fluid* as shown in Figure 2. (SAE RM-1 *Compatibility Fluid,* as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970, may be used in place of SAE RM-66-03 until October 26, 1986. **(51 F.R. 16694—May 6, 1986. Effective: May 6, 1986)]**

TABLE II—Hose Lengths

Free length between end fittings, inches	Slack, inches	
	⅛-inch or 3 mm hose or less	more than ⅛-inch or 3 mm hose
8 to 15½, inclusive	1.750	---
10 to 15½, inclusive	-----	1.000
Over 15½ to 19 inclusive	1.250	-- --
Over 19 to 24, inclusive	0.750	-----

(b) Fill the hose assembly with brake fluid, seal the lower end, and place the test assembly in an oven in a vertical position.

6.7.2 Oven treatment.

(a) Condition the hose assembly at 200° F for 70 hours.

(b) Cool the hose assembly at room temperature for 30 minutes.

(c) Drain the brake hose assembly, immediately determine that every inside diameter of any section of the hose assembly, except for that part of an end fitting which does not contain hose, is not less than 64 percent of the nominal inside diameter of the hose, and conduct the test specified in S6.2.

S6.8 Ozone resistance test. Utilize a cylinder with a diameter eight times the nominal outside diameter of the brake hose excluding armor.

S6.8.1 Preparation. After removing any armor, bind a hydraulic brake hose 360° around the cylinder. In the case of hose shorter than the circumference of the cylinder, bend the hose so that as much of its length as possible is in contact.

S6.8.2 Exposure to ozone.

(a) Condition the hose on the cylinder in air at room temperature for 24 hours.

(b) Immediately thereafter, condition the hose on the cylinder for 70 hours in an exposure chamber having an ambient air temperature of 104° F during the test and containing air mixed with ozone in the proportion of 50 parts of ozone per 100 million parts of air by volume.

(c) Examine the hose for cracks under 7-power magnification, ignoring areas immediately adjacent to or within the area covered by binding.

S6.9 End fitting corrosion resistance test. Utilize the apparatus described in ASTM B117-64, "Salt Spray (Fog) Testing."

S6.9.1 Construction. Construct the salt spray chamber so that:

(a) The construction material does not affect the corrosiveness of the fog;

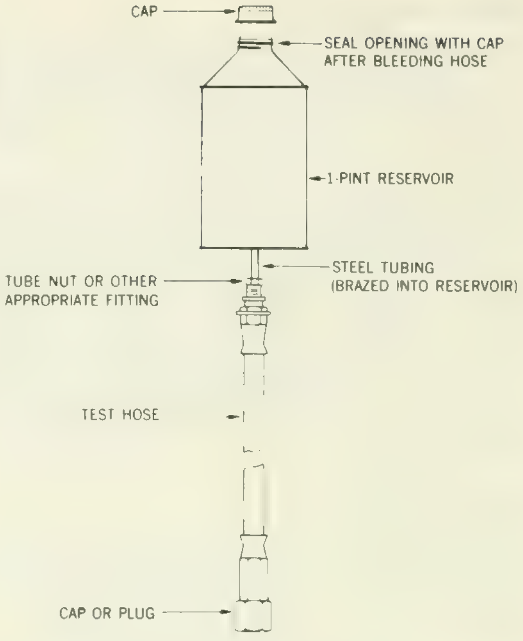
CAP
SEAL OPENING WITH CAP AFTER BLEEDING HOSE
1-PINT RESERVOIR
STEEL TUBING (BRAZED INTO RESERVOIR)
TUBE NUT OR OTHER APPROPRIATE FITTING
TEST HOSE
CAP OR PLUG

Fig 2 Brake Fluid Compatability Apparatus

(b) The hose assembly is supported or suspended 30° from the vertical and parallel to the principal direction of the horizontal flow of fog through the chamber;

(c) The hose assembly does not contact any metallic material or any material capable of acting as a wick;

(d) Condensation which falls from the assembly does not return to the solution reservoir for respraying;

(e) Condensation from any source does not fall on the brake hose assemblies or the solution collectors; and

(f) Spray from the nozzles is not directed onto the hose assembly.

S6.9.2 Preparation.

(a) Plug each end of the hose assembly.

(b) Mix a salt solution five parts by weight of sodium chloride to 95 parts of distilled water, using sodium chloride substantially free of nickel and copper, and containing on a dry basis not more than 0.1 percent of sodium iodide and not more than 0.3 percent total impurities. Ensure that the solution is free of suspended solids before the solution is atomized.

(c) After atomization at 95° F ensure that the collected solution is in the pH range of 6.5 to 7.2. Make the pH measurements at 77° F.

(d) Maintain a compressed air supply to the nozzle or nozzles free of oil and dirt and between 10 to 25 psi.

S6.9.3 Operation. Subject the brake hose assembly to the salt spray continuously for 24 hours.

(a) Regulate the mixture so that each collector will collect from 1 to 2 ml of solution per hour for each 80 square centimeters of horizontal collecting area.

(b) Maintain exposure zone temperature at 95° F.

(c) Upon completion, remove the salt deposit from the surface of the hoses by washing gently or dipping in clean running water not warmer than 100° F and then drying immediately.

S7. Requirements—Air brake hose, brake hose assemblies, and brake hose end fittings.

S7.1 Construction. Each air brake hose assembly shall be equipped with permanently attached brake hose end fittings or reusable brake hose end fittings. Each air brake hose intended for use with reusable end fittings shall conform to the dimensional requirements specified in Table III.

7.2.1 Hose. Each air brake hose shall be labeled, or cut from bulk hose that is labeled, at intervals of not more than 6 inches, measured from the end of one legend to the beginning of the next, in block capital letters and numerals at least one-eighth of an inch high, with the information listed in paragraphs (a) through (e). The information need not be present on hose after it has become part of a brake hose assembly or after it has been installed in a motor vehicle.

(a) The symbol DOT, constituting a certification by the hose manufacturer that the hose conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of the hose, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

(c) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example, 10/1/74 means October 1, 1974.

(d) [The nominal inside diameter of the hose expressed in inches or fractions of inches or in millimeters, or the nominal outside diameter of plastic tubing expressed in inches or fractions of inches or in millimeters followed by the letters OD. The abbreviation "mm" shall follow hose sizes that are expressed in millimeters. (Examples of inside diameter: ⅛, ½ (½ SP in the case of ½ inch special air brake hose), 4 mm, 6 mm. Examples of outside diameter: ¼ OD, 12 mm OD.) (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)].

TABLE III—Air Brake Hose Dimensions for Reusable Assemblies

Size, inches	Inside Diameter Tolerance, inches	TYPE I O.D., inches Min	TYPE I O.D., inches Max	TYPE II O.D., inches Min	TYPE II O.D., inches Max
3⁄16	+0.026 −0.000	0.472	0.510	0.500	0.539
¼	+0.031 −0.000	0.535	0.573	0.562	0.602
5⁄16	+0.031 −0.000	0.598	0.636	0.656	0.695
⅜	±0.023	0.719	0.781	0.719	0.781
13⁄32	+0.031 −0.000	0.714	0.760	0.742	0.789
½	+0.039 −0.000	0.808	0.854	0.898	0.945
⅝	+0.042 −0.000	0.933	0.979	1.054	1.101
½ special	±0.031	0.844	0.906	0.844	0.906

(e)) The letter "A" shall indicate intended use in air brake systems. In the case of a hose intended for use in a reusable assembly, "AI" or "AII" shall indicate Type I or Type II dimensional characteristics of the hose as described in Table III.

S7.2.2 End fittings. Except for an end fitting that is attached by deformation of the fitting about a hose by crimping or swaging, at least one component of each air brake hose fittings shall be etched, embossed, or stamped in block capital letters and numerals at least one-sixteenth of an inch high with the following information:

(a) The symbol DOT, constituting a certification by the manufacturer of that component that the component conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of that component of the fitting, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

(c) The letter "A" shall indicate intended use in air brake systems. In the case of an end fitting intended for use in a reusable assembly, "AI" or "AII" shall indicate use with Type I or Type II hose, respectively.

(d) [The nominal inside diameter of the hose to which the fitting is properly attached expressed in inches or fractions of inches or in millimeters, or the outside diameter of the plastic tubing to which the fitting is properly attached expressed in inches or fractions of inches or in millimeters followed by the letters OD (See examples in S7.2.1(d)). The abbreviations "mm" shall follow hose sizes that are expressed in millimeters. (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)].

S7.2.3 Assemblies. Each air brake hose assembly made with end fittings that are attached by crimping or swaging, except those assembled and installed by a vehicle manufacturer in vehicles manufactured by him, shall be labeled by means of a band around the brake hose assembly as specified in this paragraph or, at the option of the manufacturer, by means of labeling as specified in S7.2.3.1. The band may at the manufacturer's option be attached so as to move freely along the length of the assembly, as long as it is retained by the end fittings. The band shall be etched, embossed, or stamped in block capital letters, numerals, or symbols at least one-eighth of an inch high, with the following information:

(a) The symbol DOT, constituting certification by the hose assembler that the hose assembly conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of the hose assembly, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

S7.2.3.1 At least one end fitting of an air brake hose assembly made with end fittings that are attached by crimping or swaging shall be etched, stamped, or embossed with a designation at least one-sixteenth of an inch high that identifies the manufacturer of the hose assembly and is filed in accordance with S7.2.3(b).

S7.3 Test requirements. Each air brake hose assembly or appropriate part thereof shall be capable of meeting any of the requirements set forth under this heading, when tested under the conditions of S11 and the applicable procedures of S8. However, a particular hose assembly or appropriate part thereof need not meet further requirements after having met the constriction requirement (S7.3.1) and then having been subjected to any one of the requirements specified in S7.3.2 through S7.3.13.

S7.3.1 Constriction. Except for that part of an end fitting which does not contain hose, every inside diameter of any section of an air brake hose assembly shall be not less than 66 percent of the nominal inside diameter of the brake hose.

S7.3.2 High temperature resistance. An air brake hose shall not show external or internal cracks, charring, or disintegration visible without magnification when straightened after being bent for 70 hours at 212° F over a cylinder having the radius specified in Table IV for the size of hose tested (S8.1).

S7.3.3 Low temperature resistance. The outer cover of an air brake hose shall not show cracks visible without magnification as a result of conditioning at minus 40° F for 70 hours when bent around a cylinder having the radius specified in Table IV for the size of hose tested (S8.2).

S7.3.4 Oil resistance. After immersion in ASTM No. 3 oil for 70 hours at 212° F the volume of a specimen prepared from the inner tube and cover of an air brake hose shall not increase more than 100 percent (S8.3).

S7.3.5 Ozone resistance. The outer cover of an air brake hose shall not show cracks visible under 7-power magnification after exposure to ozone for 70 hours at 104° F (S8.4).

S7.3.6 Length change. An airbrake hose shall not contract in length more than 7 percent nor elongate more than 5 percent when subjected to air pressure of 200 psi (S8.5). "(other than a coiled nylon tube for use in an assembly that meets the requirements of § 393.45 of this title)" followed the phrase "An air brake hose."

§ 7.3.7 Adhesion. "Except for hose reinforced by wire," an airbrake hose shall withstand a tensile force of 8 pounds per inch of length before separation of adjacent layers (S8.6).

S7.3.8 Air pressure. An air brake hose assembly shall contain air pressure of 200 psi for 5 minutes without loss of more than 5 psi (S8.7).

S7.3.9 Burst strength. An air brake hose assembly shall not rupture when exposed to hydrostatic pressure of 800 psi (S8.8).

S7.3.10 Tensile strength. [An air brake hose assembly (other than a coiled nylon tube assembly which meets the requirements of § 393.45 of this title) designed for use between frame and axle or between a towed and a towing vehicle shall withstand, without separation of the hose from its end fittings, a pull of 250 pounds if it is 1/4 inch or less or 6 mm or less in nominal internal diameter, or a pull of 325 pounds if it is larger than 1/4 inch or 6 mm in nominal internal diameter. An air brake hose assembly designed for use in any other application shall withstand, without separation of the hose from its end fitting, a pull of 50 pounds if it is 1/4 inch or 6 mm or less in nominal internal diameter, 150 pounds if it is 3/8 or 1/2 inch or 10 mm to 12 mm in nominal internal diameter, or 325 pounds if it is larger than 1/2 inch or 12 mm in nominal internal diameter (S8.9). (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)]

S7.3.11 Water absorption and tensile strength. [After immersion in distilled water for 70 hours (S8.10), an air brake hose assembly (other than a coiled tube assembly which meets the requirements of § 393.45 of this title) designed for use between frame and axle or between a towed and a towing vehicle shall withstand without separation of the hose from its end fittings a pull of 250 pounds if it is 1/4 inch or 6 mm or less in nominal internal diameter, or a pull of 325 pounds if it is larger than 1/4 inch or 6 mm in nominal internal diameter. After immersion in distilled water for 70 hours (S8.10), an air brake hose assembly designed for use in any other application shall withstand without separation of the hose from its end fitting a pull of 50 pounds if it is 1/4 inch or 6 mm or less in nominal internal diameter, 150 pounds if it is 3/8 or 1/2 inch or 10 to 12 mm in nominal internal diameter, or 325 pounds if it is larger than 1/2 inch or 12 mm in nominal internal diameter (S8.9). (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)]

S7.3.12 Zinc chloride resistance. The outer cover of an air brake hose shall not show cracks visible under 7-power magnification after immersion in a 50-percent zinc chloride aqueous solution for 200 hours (S8.11).

TABLE IV—Air Brake Hose Diameters and Test Cylinder Radii

[Nominal hose diameter in. *	1/8	3/16	1/4	5/16	3/8, 13/32	7/16, 1/2	5/8
mm. *	3	4, 5	6	8	10	12	16
Radius of test cylinder in inches	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2

* These sizes are listed to provide test values for brake hoses manufactured in these sizes. They do not represent conversions. (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)].

S7.3.13 End fitting corrosion resistance. After 24 hours of exposure to spray, air brake hose end fittings shall show no base metal corrosion on the end fitting surface except where crimping or the application of label information causes a displacement of the protective coating.

S8. Test procedures—Air brake hose, brake hose assemblies, and brake hose end fittings.

S8.1 High temperature resistance test.

(a) Utilize a cylinder having the radius indicated in Table IV for the size of hose tested.

(b) Bind the hose around the cylinder and condition it in an air oven for 70 hours at 212°F.

(c) Cool the hose to room temperature, remove it from the cylinder and straighten it.

(d) Without magnification, examine the hose externally and cut the hose lengthwise and examine the inner tube.

S8.2 Low temperature resistance test.

(a) Utilize a cylinder having the radius indicated in Table IV for the size of hose tested.

(b) Condition the cylinder and the brake hose, in a straight position, in a cold box at minus 40° F for 70 hours.

(c) With the hose and cylinder at minus 40° F, bend the hose 180 degrees around the cylinder at a steady rate in a period of 3 to 5 seconds.

S8.3 Oil resistance test. Utilize three test specimens and average the results.

S8.3.1 Preparation. Fashion a test specimen by cutting a rectangular block 2 inches long and not less than one-third of an inch in width, having a thickness of not more than one-sixteenth inch, from the brake hose and buff the specimen on both faces to ensure smooth surfaces.

S8.3.2 Measurement.

(a) Weigh each specimen to the nearest milligram in air (W1) and in distilled water (W2) at room temperature. If wetting is necessary to remove air bubbles, dip the specimen in acetone and thoroughly rinse it with distilled water.

(b) Immerse each specimen in ASTM No. 3 oil for 70 hours at 212° F and then cool in ASTM No. 3 oil at room temperature for 30 to 60 minutes.

(c) Dip the specimen quickly in acetone and blot it lightly with filter paper.

(d) Weigh each specimen in a tared weighing bottle (W3) and in distilled water (W4) within five minutes of removal from the cooling liquid.

(e) Calculate the percentage increase in volume as follows:

$$\text{Percent of increase} = \frac{(W_3 - W_4) - (W_1 - W_2)}{(W_1 - W_2)} \text{x } 100$$

S8.4 Ozone resistance test. Conduct the test specified in S6.8 using air brake hose.

S8.5 Length change test.

(a) Position a test hose in a straight, horizontal position, and apply air pressure of 10 psi thereto.

(b) Measure the hose to determine original free length.

(c) Without releasing the 10 psi, raise the air pressure to the test hose to 200 psi.

(d) Measure the hose under 200 psi to determine final free length. An elongation or contraction is an increase or decrease respectively, in the final free length from the original free length of the hose.

S8.6 Adhesion test.

S8.6.1 Apparatus. [A tension testing machine that is power-driven and that applies a constant rate of extension is used for measuring the force required to separate the layers of the test specimen. The apparatus is constructed so that:

(a) The recording head includes a freely rotating form with an outside diameter substantially the same as the inside diameter of the hose specimen to be placed on it.

(b) The freely rotating form is mounted so that its axis of rotation is in the plane of the ply being separated from the specimen and so that the applied force is perpendicular to the tangent of the specimen circumference at the line of separation.

(c) The rate of travel of the power-actuated grip is a uniform one inch per minute and the capacity of the machine is such that maximum applied tension during the test is not more than 85 percent nor less than 15 percent of the machine's rated capacity.

(d) The machine produces a chart with separation as one coordinate and applied tension as the other. **(51 F.R. 603—January 7, 1986, Effective: July 6, 1986)]**

S8.6.2 Preparation.

(a) Cut a test specimen of 1 inch or more in length from the hose to be tested and cut the layer to be tested of that test specimen longitudinally along its entire length to the level of contact with the adjacent layer.

(b) Peel the layer to be tested from the adjacent layer to create a flap large enough to permit attachment of the power-actuated clamp of the apparatus.

(c) Mount the test specimen on the freely rotating form with the separated layer attached to the power-actuated clamp.

S8.6.3 Operation. Reserved

S8.6.4 Calculations.

(a) [The adhesion value shall be the minimum force recorded on the chart excluding that portion of the chart which corresponds to the initial and final 20 percent portion along the displacement axis. **(51 F.R. 603—January 7, 1986. Effective: July 6, 1986)]**.

(b) Express the force in pounds per inch of length.

S8.7 Air pressure test.

(a) Connect the air brake hose assembly to a source of air pressure.

(b) Apply 200 psi air pressure to the hose and seal the hose from the source of air pressure.

(c) After 5 minutes, determine the air pressure remaining in the test specimen.

S8.8 Burst strength test.

(a) Utilize an air brake hose assembly.

(b) Fill the hose assembly with water, allowing all gases to escape. Apply water pressure at a uniform rate of increase of approximately 1,000 psi per minute until the hose ruptures.

S8.9 Tensile strength test. Utilize a tension testing machine conforming to the requirements of the Methods of Verification of Testing Machines (1964 American Society for Testing and Materials, Designation E4), and provided with a recording device to register total pull in pounds.

(a) Attach an air brake hose assembly to the testing machine to permit straight, even, machine-pull on the hose.

(b) Apply tension at a rate of 1 inch per minute travel of the moving head until separation occurs.

TABLE V—Vacuum Brake Hose Test Requirements

Hose inside diameter*		High temperature resistance		Low temperature resistance		Bend		Deformation—collapsed inside diameter (dimension D), inches
Inches	Millimeters	Hose length, inches	Radius of cylinder, inches	Hose length, inches	Radius of cylinder inches	Hose length, inches	Maximum collapse of outside diameter, inches	
7/32	5	8	1½	17½	3	7	11/64	3/64
¼	6	9	1½	17½	3	8	3/32	1/16
9/32		9	1¾	19	3½	9	12/64	4/64
11/32	8	9	1¾	19	3½	11	13/64	5/64
⅜	10	10	1¾	19	3½	12	5/32	3/32
7/16		11	2	20½	4	14	17/64	5/64
15/32		11	2	20½	4	14	17/64	5/64
½	12	11	2	20½	4	16	7/32	⅛
⅝	16	12	2¼	22	4½	22	7/32	5/32
¾		14	2½	24	5	28	7/32	3/16
1.0		16	3¼	28½	6½	36	9/32	¼

* These sizes are listed to provide test values for brake hoses in these sizes. They do not represent conversions.

S8.10 Water absorption and tensile strength test. Immerse an air brake hose assembly in distilled water at room temperature for 70 hours. Thirty minutes after removal from the water, conduct the test specified in S8.9.

S8.11 Zinc chloride resistance test. Immerse an air brake hose in a 50-percent zinc chloride aqueous solution at room temperature for 200 hours. Remove it from the solution and examine it under 7-power magnification for cracks.

S8.12 End fitting corrosion resistance test. Conduct the test specified in S6.9 using an air brake hose assembly.

S9. Requirements—vacuum brake hose, brake hose assemblies, and brake hose end fittings.

9.1 Labeling.

S9.1.1 Hose. Each vacuum brake hose shall be labeled, or cut from bulk hose that is labeled, at intervals of not more than 6 inches, measured from the end of one legend to the beginning of the next, in block capital letters and numerals at least one-eighth of an inch high, with the information listed in paragraphs (a) through (e). The information need not be present on hose after it has become part of a brake hose assembly or after it has been installed in a motor vehicle.

(a) The symbol DOT, constituting a certification by the hose manufacturer that the hose conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of the hose, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

(c) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example, 10/1/74 means October 1, 1974.

(d) [The nominal inside diameter of the hose expressed in inches or fractions of inches or in millimeters, or the nominal outside diameter of plastic tubing expressed in inches or fractions of inches or in millimeters followed by the letters OD. The abbreviation "mm" shall follow hose sizes that are expressed in millimeters. (Example of inside diameter: 7/32, 1/4, 4 mm. Example of outside diameter: 1/4 OD, 12 mm OD.) (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)]

(e) The letters "VL" or "VH" shall indicate that the component is a light-duty vacuum brake hose or heavy-duty vacuum brake hose, respectively.

S9.1.2 End Fittings. Except for an end fitting that is attached by heat shrinking or by interference fit with plastic vacuum hose or that is attached by deformation of the fitting about a hose by crimping or swaging, at least one component of each vacuum brake hose fitting shall be etched, embossed, or stamped in block capital letters and numerals at least one-sixteenth of an inch high with the following information:

(a) The symbol DOT, constituting a certification by the manufacturer of that component that the component conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of that component of the fitting, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

(c) The letters "VL" or "VH" shall indicate that the end fitting is intended for use in a light-duty or heavy-duty vacuum brake system, respectively.

(d) [The nominal inside diameter of the hose to which the fitting is properly attached expressed in inches or fractions of inches or in millimeters, or the outside diameter of the plastic tubing to which the fitting is properly attached expressed in inches or fraction of inches or in millimeters followed by the letters OD (See examples in S9.1.1 (d)). The abbreviation "mm" shall follow hose sizes that are expressed in millimeters. (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)]

S9.1.3 Assemblies. Each vacuum brake hose assembly made with end fittings that are attached by crimping or swaging and each plastic tube assembly made with end fittings that are attached by heat shrinking or dimensional interference fit, except those assembled and installed by a vehicle manufacturer in vehicles manufactured by him, shall be labeled by means of a band around the brake hose assembly as specified in this paragraph or, at the option of the manufacturer, by means of labeling as specified in S9.1.3.1 The band may at the manufacturer's option attached so as to move freely along the length of the assembly, as long as it is retained by the end fittings. The band shall be etched, embossed, or stamped, in block capital letters and numerals at least one-eighth of an inch high, with the following information:

(a) The symbol DOT, constituting certification by the hose assembler that the hose assembly conforms to all applicable motor vehicle safety standards.

(b) A designation that identifies the manufacturer of the hose assembly, which shall be filed in writing with: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. The designation may consist of block capital letters, numerals, or a symbol.

S9.1.3.1 At least one end fitting of a vacuum brake hose assembly made with end fittings that are attached by crimping or swaging, or of a plastic tubing assembly made with end fittings that are attached by heat shrinking or dimensional interference fit shall be etched, stamped, or embossed with a designation at least one-sixteenth of an inch high that identifies the manufacturer of the hose assembly and is filed in accordance with S9.1.3(b).

S9.2 Test requirements. Each vacuum brake hose assembly or appropriate part thereof shall be capable of meeting any of the requirements set forth under this heading, when tested under the conditions of S11 and the applicable procedures of S10. However, a particular hose assembly or appropriate part thereof need not meet further requirements after having met the constriction requirement (S9.2.1) and then having been subjected to any one of the requirements specified in S9.2.2 through S9.2.11.

S9.2.1 Constriction. Except for that part of an end fitting which does not contain hose, every inside diameter of any section of a vacuum brake hose assembly shall be not less than 75 percent of the nominal inside diameter of the hose if for heavy duty, or 70 percent of the nominal inside diameter of the hose if for light duty.

S9.2.2 High temperature resistance. A vacuum brake hose shall not show external or internal cracks, charring, or disintegration visible without magnification when straightened after being bent for 70 hours at 212° F over a cylinder having the radius specified in Table V for the size of hose tested (S10.1).

S9.2.3 Low temperature resistance. A vacuum brake hose shall not show cracks visible without magnification after conditioning at minus 40° F for 70 hours when bent around a cylinder having the radius specified in Table V for the size hose Tested (S10.2).

S9.2.4 Ozone resistance. A vacuum brake hose shall not show cracks visible under 7-power magnification after exposure to ozone for 70 hours (S10.3).

S9.2.5 Burst strength. A vacuum brake hose shall not rupture under hydrostatic pressure of 350 psi (S10.4).

S9.2.6 Vacuum. The collapse of the outside diameter of a vacuum brake hose under internal vacuum of 26 inches of Hg for five minutes shall not exceed one-sixteenth of an inch (S10.5).

S9.2.7 Bend. The collapse of the outside diameter of a vacuum brake hose at the middle point of the test length when bent until the ends touch shall not exceed the values given in Table V for the size of hose tested (S10.6).

S9.2.8 Swell. Following exposure to Reference Fuel A, every inside diameter of any section of a vacuum brake hose shall be not less than 75 percent of the nominal inside of the hose if for heavy duty, or 70 percent of the nominal inside diameter of the hose if for light duty. The vacuum brake hose shall show no leakage and there shall be no separation of the inner tube from the fabric reinforcement of the hose in a vacuum test of 26 inches of Hg for 10 minutes (S10.7).

S9.2.9 Adhesion. "Except for hose reinforced by wire," a vacuum brake hose shall withstand a force of 8 pounds per inch of length before separation of adjacent layers (S10.8).

S9.2.10 Deformation. A vacuum brake hose shall return to 90 percent of its original outside diameter within 60 seconds after five applications of force as specified in S10.9, except that a wire-reinforced hose need only return to 85 percent of its original outside diameter. In the case of heavy-duty hose the first application of force shall not exceed a peak value of 70 pounds, and the fifth application of force shall reach a peak value of at least 40 pounds. In the case of light-duty hose the first application of force shall not exceed a peak value of 50 pounds, and the fifth application of force shall reach a peak value of at least 20 pounds (S10.9).

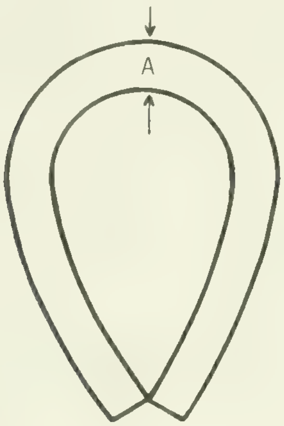

Fig. 3—Bend Test of Vacuum Brake Hose.

S9.2.11 End fitting corrosion resistance. After 24 hours of exposure to salt spray, vacuum brake hose end fittings shall show no base metal corrosion of the end fitting surface except where crimping or the application of labeling information has caused displacement of the protective coating.

S10. Test procedures—Vacuum brake hose, brake hose assemblies, and brake hose and fittings.

S10.1 High temperature resistance test. Conduct the test specified in S8.1 using vacuum brake hose with the cylinder radius specified in Table V for the size of hose tested.

S10.2 Low temperature resistance test. Conduct the test specified in S8.2 using vacuum brake hose with the cylinder radium specified in Table V for the size of hose tested.

S10.3 Ozone resistance test. Conduct the test specified in S6.8 using vacuum brake hose.

S10.4 Burst strength test. Conduct the test specified in S8.8 using vacuum brake hose.

TABLE VI

Dimensions of Test Specimen and Feeler Gage for Deformation Test

*Hose Inside Diameter** *(inch)*		*Specimen Dimensions (see Fig. 4)*		*Feeler Gage Dimensions*	
	Mm.	*D (inch)*	*L (inch)*	*Width (inch)*	*Thickness (inch)*
[7/32	5	3/64	1	1/8	3/64
1/4	6	1/16	1	1/8	1/16
9/32		1/16	1	1/8	1/16
11/32	8	5/64	1	3/16	5/64
3/8	10	3/32	1	3/16	3/32
7/16		5/64	1	1/4	5/64
15/32		5/64	1	1/4	5/64
1/2	12	1/8	1	1/4	1/8
5/8	16	5/32	1	1/4	5/32
3/4		3/16	1	1/4	3/16
1.0		1/4	1	1/4	1/4]

* These sizes are listed to provide test values for brake hoses manufactured in these sizes. They do not represent conversions. (50 F.R. 4691—February 1, 1985. Effective: June 3, 1985)

S10.5 Vacuum test. Utilize a 12-inch vacuum brake hose assembly sealed at one end.

(a) Measure the hose outside diameter.

(b) Attach the hose to a source of vacuum and subject it to a vacuum of 26 inches of Hg for 5 minutes.

(c) Measure the hose to determine the minimum outside diameter while the hose is still subject to vacuum.

§ 10.6 Bend test.

(a) Bend a vacuum brake hose, of the length prescribed in Table V, in the direction of its normal curvature until then ends just touch, as shown in Figure 3.

(b) Measure the outside diameter of the specimen at point A before and after bending.

(c) The difference between the two measurements is the collapse of the hose outside diameter on bending.

S10.7 Swell test.

(a) Fill a specimen of vacuum brake hose 12 inches long with Reference Fuel A as described in the Method of Test for Change in Properties of Elastomeric Vulcanizers Resulting From Immersion in Liquids (1964 American Society for Testing and Materials Designation D471).

(b) Maintain reference fuel in the hose under atmospheric pressure at room temperature for 48 hours.

(c) Remove fuel and determine that every inside diameter of any section of the brake hose is not less than 75 percent of the nominal inside diameter of the hose for heavy-duty hose and 70 percent of the nominal inside diameter of the hose for light-duty hose.

(d) Subject the hose specimen to a vacuum of 26 inches of Hg for 10 minutes.

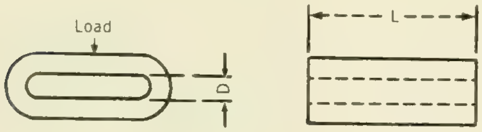

Fig 4 Deformed Specimen of Vacuum Brake Hose

S10.8 Adhesion test. Conduct the test specified in S8.6 using vacuum brake hose.

S10.9 Deformation test. Table VI specifies the test specimen dimensions.

S10.9.1 Apparatus. Utilize a compression device, equipped to measure force of at least 100 pounds, and feeler gauges of sufficient length to be passed completely through the test specimen.

S10.9.2 Operation.

(a) Position the test specimen longitudinally in the compression device with the fabric laps not in the line of the applied pressure.

(b) Apply gradually increasing force to the test specimen to compress its inside diameter to that specified in Table VI (dimension D of Figure 4) for the size of hose tested.

(c) After 5 seconds release the force and record the peak load applied.

(d) Repeat the procedure four times permitting a 10-second recovery period between load applications.

S10.10 End fitting corrosion resistance test.

Conduct the test specified in S6.9 using a vacuum brake hose assembly.

S11. Test conditions. Each hose assembly or appropriate part thereof shall be able to meet the requirements of S5, S7, and S9 under the following conditions.

S11.1 The temperature of the testing room is 75° F.

S11.2 Except for S6.6, S8.2, and S10.2, the test samples are stabilized at test room temperature prior to testing.

S11.3 The brake hoses and brake hose assemblies are at least 24 hours old, and unused.

S12. Notwithstanding any other provision of this standard, a brake hose assembly shall meet each requirement of this standard, except that the assembly may be constructed of brake hose which meets every requirement of the standard for hose other than the hose labeling requirements of S5.2, S7.2, and S9.1, and the assembly may be constructed of end fittings which meet every requirement of the standard for end fittings other than the end fitting labeling requirements of S5.2, S7.2, and S9.1.

S13. Notwithstanding any other provision of this standard, a vehicle to which this standard applies shall be equipped with brake hose, brake hose end fittings, and brake hose assemblies that meet each requirement of this standard, with the following exceptions:

(a) The vehicle may be equipped with brake hose that meets every requirement of the standard for hose other than the hose labeling requirements of S5.2, S7.2, and S9.1;

(b) The vehicle may be equipped with end fittings that meet every requirement of the standard for end fittings other than the end fitting labeling requirements of S5.2, S7.2, and S9.1; and

(c) The vehicle may be equipped with brake hose assemblies that meet every requirement of the standard for assemblies other than the assembly labeling requirements of S5.2, S7.2, and S9.1.

38 F.R. 31302
November 13, 1973

MOTOR VEHICLE SAFETY STANDARD NO. 107

Reflecting Surfaces—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

S1. Purpose and scope. This standard specifies reflecting surface requirements for certain vehicle components in the driver's field of view.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles trucks, and buses.

S3. Definitions. "Field of view" means the area forward of a lateral vertical plane which is located tangent to the rearmost boundary of the SAE 99th percentile eye range contour of SAE Recommended Practice J941, November 1965. "Specular gloss" means the luminous fractional reflectance of a specimen at the specular direction.

S4. Requirements. The specular gloss of the surface of the materials used for the following bright metal components in the driver's field of view shall not exceed 40 units when measured by the 20° method of ASTM Standard D523-62T, June 1962—

(a) Windshield wiper arms and blades;

(b) Inside windshield mouldings;

(c) Horn ring and hub of steering wheel assembly; and

(d) Inside rearview mirror frame and mounting bracket.

32 F.R. 2411
February 3, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers and Motorcycles

(Docket No. 69–18)

On January 3, 1970, a proposal to amend Federal Motor Vehicle Safety Standard No. 108 (Docket No. 69–18) was published in the *Federal Register* (35 F.R. 106). Comments were requested on 25 proposed amendments.

Interested persons have been afforded an opportunity to participate in the rulemaking process and their comments have been considered in the amendments published today. Except as otherwise noted, the amendments are effective July 1, 1971. The amendments are discussed below in the order in which the proposals were published. Unless otherwise indicated, there were no significant objections to the proposals that are being adopted.

(a) It was proposed that Standard No. 108 be extended to include requirements for replacement lighting equipment on vehicles manufactured to comply with Standard No. 108, and all replacement sealed beam headlamp units, lamp bulbs, and plastic lenses.

The proposal to include replacement equipment on vehicles manufactured on or after the effective date of the standard (July 1, 1971) has been adopted. However, the proposal to include all replacement sealed beam headlamp units, lamp bulbs, and plastic lenses on vehicles manufactured prior to that date has been deferred because of the difficulties involved in retrofitting vehicles that were not originally manufactured to conform to Standard No. 108. Further study is necessary of the problems, leadtime, and costs involved in designing and testing replacement equipment for older vehicles that meets the standards required of motor vehicles manufactured today.

(b) The present intermediate side marker device requirement covering vehicles 30 feet or more in overall length, and 80 inches and more in overall width, has been extended to cover vehicles of lesser width.

Commenters requested that the overall length of a trailer be interpreted to exclude the length of the trailer tongue. However, it has been determined that when the rear of a trailer is 30 feet or more from the towing vehicle, intermediate side marker devices are warranted, regardless of the length of the trailer tongue.

(c) SAE Standard J594d, "Reflex Reflectors", has replaced J594c as the basic reference for this item of lighting equipment. Some commenters felt that Class B reflectors (eliminated in J594d) should still be permitted for motorcycles, but the Bureau believes that a motor vehicle whose conspicuity is already marginal should be required to have Class A reflectors.

(d) Self-canceling turn signal operating units wil be required on all vehices less than 80 inches in overall width. One commenter requested excluding all trucks, truck tractors, and commercial vehicles regardless of vehicle width, and several commenters requested the elimination of the requirement for cancellation by steering wheel rotation.

Since the operation of vehicles less than 80 inches in overall width is similar to that of passenger vehicles and other vehicles of lesser width are operated by drivers other than pro-

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fessionals, their exclusion from this requirement is not warranted.

The Bureau is studying automatic cancellation by time or distance, or both, but current evidence indicates that these methods, given the state of the art, are inferior to cancellation by steering wheel rotation.

(e) As proposed, amber has been eliminated as an optional color of the stop lamp.

(f) The minimum candlepower of any separately mounted stoplamp will equal that of a Class A turn signal lamp.

Many commenters requested a longer leadtime to comply. The requests have been found reasonable, and good cause has been shown for an effective date of January 1, 1973. Other comments suggested consideration of stop lamp candlepower in connection with dual intensity signals, allowance for multiple compartment lamps, and retention of the present Class B intensity for motorcycle stop lamps.

Dual intensity signals have not been proposed, and since time is required for development and implementation of such a proposal, a requirement for increased minimum candlepower in stop lamps cannot be deferred. No justification has been found for not requiring Class A intensity for motorcycle stop lamps. The standard is therefore being amended as proposed, with clarifying provisions for multiple compartment stop lamps.

(g) It was proposed that motorcycles should be equipped with turn-signal lamps, that there be a maximum candlepower limitation on amber rear-mounted lamps, and that minimum photometric output of head and tail lamps at engine idle speeds should be specified.

Several comments objected to the maximum candlepower proposal and the mounting requirements specified in the proposed Table IV. Also, comments indicated potential problems if minimum photometric output were specified, suggesting instead reference to SAE Recommended Practice J392, "Motorcycle and Motor Driven Cycle Electrical System Maintenance of Design Voltage", December 1969.

Glare candlepower tests on signal lamps installed on the rear of motor vehicles have consistently indicated that a specification in excess of 300 candlepower for both red and amber lamps is not desirable. A manufacturer encountering problems of exceeding this maximum with amber lamps has the option of using red lamps, which have a lower minimum required candlepower.

The detection and interpretation of turn signal lamps improves as they are mounted farther away from the centerline of the vehicle and from other lamps. Some motorcycle manufacturers, recognizing this fact, have installed the turn signal lamps in the ends of the handlebars, exceeding the requirements adopted in the amendment. The mounting requirements for these lamps specified in Table IV are considered reasonable and practicable for motorcycles.

The standard is being amended as proposed, except that minimum photometric output of headlamps and taillamps at engine idle speeds is not specified. Minimum photometrics are currently being studied for further rulemaking. Since an incorporation by reference to SAE Recommended Practice J392 was not proposed, it is beyond the scope of this rulemaking to incorporate it in the amendment.

(h) Aging and weathering requirements for plastic materials used for optical parts are specified. Although the comments generally supported this revision, many requested a more realistic test than continuous operation of stop and backup lamps in an oven for 1 hour to determine lens warpage. Accordingly, the amendment requires a cycle of operation of 10 minutes' duration followed by 10 minutes' rest during the 1 hour test. Comments suggesting extending the 2-year outdoor exposure test to 3 years and additional oven test details were beyond the scope of the proposal, and will be considered in future rulemaking actions.

(i) As proposed, the words "it is recommended that," "recommendations," or "should be" appearing in any referenced and subreferenced SAE standard shall be read as setting forth mandatory requirements, with minor exceptions covering certain aspects of school bus warning lamps.

(j) Specific tolerances for mounting lamps and reflectors "as far apart as practicable" were proposed, but have not been adopted.

Several comments recommended adopting the ISO (International Standards Organization) requirements that lamps and reflectors be mounted within 16 inches of the edge of the vehicle. Others stated that the Bureau did not have the authority to establish tolerances.

Vehicles having lamps located in conformance with ISO regulations may create problems of distance judgment resulting in driver error. Lamps could be mounted in a range from a minimum of 25 inches apart on small imported passenger cars to a maximum of 74 inches apart on standard domestic cars.

The location of lamps and reflectors is clearly safety related, as it facilitates clearance and distance estimation, detection of signals, and similar functions. The Bureau therefore has the authority to establish horizontal mounting tolerances, analogous to the vertical tolerances that have already been established.

Major changes in lighting requirements may result in the rulemaking action proceeding under Docket No. 69-19. New requirements such as horizontal mounting tolerances need relatively long leadtimes. Accordingly, this proposal has not been adopted, and the requirement for lamps and reflectors is still that they be located "as far apart as practicable."

(k) Lamps and reflectors must meet specified visibility angles when mounted on the vehicle.

Some comments pointed out that when special equipment such as mirrors and snow plows is mounted on the vehicle visibility and photometric test angles may not be met. The amendment allows compliance with this requirement by means of auxiliary lighting devices.

Items (l) through (o) represents proposals which were adopted:

(l) The axis of side reflex reflectors for the photometric test has been defined.

(m) The minimum mounting height for reflectors mounted on the rear of truck tractor cabs will be 4 inches above the height of the rear tires.

(n) Combination turn signal and hazard warning signal flashers will meet the requirements applicable to each, when tested in sequence. Manufacturers of turn signal and hazard warning signal flashers have commented that economic factors and the current state of the art in manufacturing lamps preclude a quality level that would totally eliminate occasional random failures. This condition is reflected in the language in Standard No. 108 that lighting equipment "shall be designed to conform" to the stated requirements. The SAE recognizes the problem by specifying an allowable percentage of failures in SAE Standards J590b, "Automotive Turn signal Flasher," and J945, "Vehicular Hazard Warning Signal Flasher." Such a provision is inappropriate, however, for regulatory purposes. It is doubtful that specific failure allowance in a standard would correspond with the statutory mandate that "No person shall manufacture for sale * * * any motor vehicle or item of motor vehicle equipment * * * unless it is in conformity with [any applicable] standard". (15 U.S.C. 1397(a)(1)). From a practical standpoint, such a provision would tend to make the requirement unenforceable except in extreme cases, since failures within a single lot are statistically inconclusive in determining the extent of failures in overall production. Therefore the sampling provisions of the two SAE Standards, originally incorporated by reference in Standard No. 108, are expressly omitted from the standard in this issuance. The omission should not cause a hardship, since the "designed to conform" language has been retained.

(o) SAE Recommended Practice J565b, "Semi-Automatic Headlamp Beam Switching Devices", has replaced J565a as the basic reference for this item of lighting equipment.

(p) It was proposed that all vehicles be equipped with a turn signal pilot indicator, and that those vehicles not equipped to tow trailers (i.e. vehicles with a fixed load flasher) be provided with a lamp failure indicator.

If visible to the rider, motorcycle front turn signal lamps can serve as the pilot indicator, as permitted in SAE Standard J588d, "Turn Signal Lamps".

Many comments objected to the proposal for a lamp failure indicator on vehicles 80 inches or more in overall width. Heavy-duty flashers used on these vehicles are not presently available with a failure indicator. However, this type flasher is considerably more durable than the fixed-load type, used on vehicles of lesser width, which indicates a lamp failure, and the continued use of present heavy-duty flashers for wider vehicles is warranted. Also, vehicles of 80 inches or more overall width are generally used commercially, and many of them are subject to the regulations of the Bureau of Motor Carrier Safety of the Federal Highway Administration; such vehicles are more frequently inspected and failed lamps more promptly repaired. For the foregoing reasons, vehicles of 80 or more inches overall width are excluded from the requirement in the amended standard for a turn signal lamp failure indicator.

(q) As proposed, on vehicles less than 80 inches in overall width, license plate lamps and side marker lamps must be on when the headlamps are on, and the taillamps, license plate lamps, and side marker lamps when the parking lamps are on.

(r) No lamps that are normally steady-burning will be allowed to flash automatically for signaling purposes, except headlamps and side marker lamps.

Some commenters requested that additional lamps be permitted to flash, and some requested that flashing headlamps be prohibited.

With the exception of certain signals such as turn signals, hazard warning, and schoolbus warning signals, flashing lamps should be reserved for emergency and road-maintenance-type vehicles. Flashing lamps are otherwise prohibited in the Uniform Vehicle Code. Any lamp may be flashed by the vehicle driver by merely turning the standard lamp switch on and off, and this standard cannot prohibit such operation. However, the definition of "flash" adopted in the amendment makes clear that automatic flashers for use with steady burning lamps other than headlamps and side marker lamps are prohibited.

(s) SAE Standard J593c, "Backup Lamps", has replaced J592b as the basic reference for these lamps. The clarification is made that the center of the backup lamp lens is the optical center. However, because of the leadtime that will be required for manufacturers to alter their designs, good cause is considered shown for an effective date of January 1, 1973.

(t) Headlamp mountings will be required to meet SAE Recommended Practice J566, "Headlamp Mountings". Although some comments suggested that this was a redundant requirement, it has been determined that this set of requirements contains important safety elements such as requiring lateral adjustability of motorcycle headlamps, adjustability of all headlamps by one man with ordinary tools, and that the aim will not be disturbed under ordinary conditions of service, matters that are not dealt with elsewhere in Standard No. 108.

(u) Turn signal operating units must be capable of meeting a durability test of 100,000 cycles. Most of the comments stated that the 175,000-cycle durability test proposed for passenger cars would be difficult to meet and recommended that SAE Standard J589a be referenced instead of J589. Since J589a includes other changes that were not proposed (temperature test, durability test cycle rate, and ambient temperature), it is beyond the scope of this rulemaking to incorporate it by reference in the amended standard. However, a 100,000-cycle durability test has been adopted, as specified in J589a.

(v) The mounting requirements for clearance lamps have been amended to indicate that delineating overall vehicle width, rather than vehicle height, is the primary purpose of these lamps, and a clarification has been added that clearance lamps on truck tractors may be mounted so as to indicate the width of the cab.

(w) Identification lamps must be mounted as high as practicable, and the maximum permissible spacing between the lamps has been reduced from 12 inches to 8 inches.

Objections to these requirements were received primarily because the reduced spacing would create mounting problems due to interference with functional hardware, such as air conditioners and door locking mechanisms. The 8-inch maximum spacing has been adopted, but spacing 6 to 12 inches apart is allowed when 8-inch maximum spacing is not practicable.

(x) License plate lamps must illuminate the plate from the top or sides only.

This is a standard practice with domestic vehicle manufacturers, but not with foreign ones. Foreign manufacturers objected because of inadequate leadtime, and the proposal has been adopted with an effective date of January 1, 1973.

(y) A maximum mounting height of 72 inches is specified for turn signal lamps.

Objections were received from manufacturers of cab-over-engine trucks and of snow removal equipment who commented that such a requirement would restrict turn signal placement. However, since no exceptions are specified for headlamp mounting (24–54 inches), none are considered necessary for turn signal lamps (15–72 inches) for these vehicles.

Other comments suggested revisions to the standard that went beyond the scope of the proposal. Those that appear to have merit will be considered in future rulemaking actions.

In consideration of the foregoing, 49 CFR 571.21, Federal Motor Vehicle Safety Standard No. 108, Lamps, Reflective Devices, and Associated Equipment, is amended to read as set forth below.

Effective date: July 1, 1971, except as otherwise noted in the text of the rule.

Issued on October 22, 1970.

Douglas W. Toms,
Director,
National Highway Safety Bureau.

35 F.R. 16840
October 31, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers and Motorcycles

(Docket No. 69–18)

Motor Vehicle Safety Standard No. 108, establishing requirements for lamps, reflective devices, and associated equipment on motor vehicles was amended on October 31, 1970 (35 F.R. 16840). Thereafter, pursuant to 49 CFR 553.35 (35 F.R. 5119) petitions for reconsideration of the amendment were filed by Freightliner Corp., Ford Motor Co., Japan Automobile Manufacturers Association, Inc., Wagner Electric Corp., General Motors Corp., Chrysler Corp., Rohm and Haas Co., Motor Coach Industries, International Harvester Co., and Motorcycle Industry Council, Inc. The petitions of Harley-Davidson Motor Co., Inc., Kawasaki Motors Corp., White Motor Corp., Hackney Bros. Body Co., and a supplement to the Japan AMA petition were not timely filed, and have been treated as petitions for rulemaking pursuant to 49 CFR 553.31. However, some of the issues raised in these petitions are similar to those contained in timely filed petitions.

In response to information contained in several of the petitions the standard is being amended. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Effective date.* General Motors, Ford, and Chrysler have petitioned for an extension of the effective date, stating that compliance is impracticable for 1971 models which, as of July 1, 1971, have only a short production life before the end of the model run. The Bureau has determined therefore that an effective date later than 1 year from issuance of the original amendment is in the public interest. The effective date of the standard is extended to January 1, 1972.

2. *Paragraph S4.1.1.7.* This paragraph is being amended to clarify that its stop lamp requirement does not apply to passenger cars manufactured before January 1, 1973, and to correctly cite SAE Standard J588d, "Turn Signal Lamps," June 1966, as the standard incorporated by reference.

3. *Paragraph S4.1.1.14.* The amendment inadvertently omitted installation requirements for backup lamps. This paragraph is hereby amended to correct the omission, and to insure that current installation requirements remain in effect until January 1, 1973.

4. *Paragraph S4.1.1.16.* Japan AMA and Motorcycle Industry Council objected to the portion of this paragraph that would require motorcycles, as of January 1, 1973, to be equipped with turn-signal units designed to complete a durability test of 100,000 cycles. In order to allow time for further industry study and comment on this aspect of performance, the requirement is withdrawn from the standard. It is anticipated, however, that an increased durability test cycle for motorcycle turn-signals will be proposed in a future rulemaking action.

5. *Paragraph S4.1.2.* Ford, Chrysler, and Rohm and Haas petitioned for reduction of the heat test cycle of the warpage test from 10 to 5 minutes or, in the alternative for an extension of the effective date of this requirement. The Traffic Safety Administration has determined that the 10-minute cycle is appropriate because of the frequency of usage of stop and backup lamps. The petitions for reduction of the test cycle are therefore denied. However, because of the leadtime for development and tooling of new

lamps which may be required, good cause is considered shown for postponement of the effective date for this requirement until January 1, 1973.

6. *Paragraph S4.3.1.8 and Table II.* General Motors, Motor Coach Industries, and International Harvester objected to the reduction in the maximum allowable spacing of identification lamps (from 6 to 12 inches, to 6 to 8 inches), alleging that there is no safety justification for the requirement, and that compliance by July 1, 1971, is impracticable. It is recognized that other approaches to wide-vehicle identification, such as minimum spacing between identification and clearance lamps, have merit. These approaches are being considered and, as deemed appropriate, will be incorporated into future rulemaking proposals. Accordingly, the petitions are granted; Table II is amended to reinstate the 6 to 12 inch spacing, and S4.3.1.8 is deleted.

7. *Paragraph S4.4.2 and Tables I and III.* Wagner Electric petitioned for reconsideration of the omission of sampling provisions from SAE Standard J590b, "Turn-Signal Units," October 1965, and SAE Standard J945, "Vehicular Hazard Warning Unit," February 1966. Letters have also been received inquiring as to the number of flashers constituting a sample for test and the number of failures allowable for compliance. Standard No. 108 was amended without notice to omit sampling provisions in order to bring the standard into conformity with the National Traffic and Motor Vehicle Safety Act of 1966, which requires that all items conform to applicable standards. Therefore the safety standards should not specify sampling provisions or failure rates. It is the manufacturer's responsibility to institute a test program that is sufficient to legally constitute due care, on a continuing basis, to insure that all products manufactured after the effective date of a standard meet the applicable requirements. However, in response to the procedural objection that the change is important enough to merit notice and opportunity for comment, Wagner's petition is granted and paragraph S4.4.2 and Tables I and III are being amended to strike the language precluding sampling provisions. At the same time, this agency is publishing today a notice (Docket No. 69–18; Notice 3, 36 F.R. 1913) proposing omission of sampling provisions as of January 1, 1972, the date when this omission would otherwise have been effective.

8. *Paragraph S4.5.6.* International Harvester asked that the exemption for lamp outage indication be extended to vehicles equipped with auxiliary lamps or wiring, since these vehicles, like vehicles equipped to tow trailers, use variable load flashers. However, fixed load flashers providing lamp outage indication are available on the market for the increased load of an auxiliary lamp. The manufacturer can provide the appropriate flasher with foreknowledge of the intended end configuration of the vehicle, and International Harvester's petition is therefore denied.

9. *Tables II and IV.* Freightliner, International Harvester, and White Motor requested that the maximum mounting height allowable for turn-signal units, 72 inches, be reconsidered. This agency believes that most turn-signal lamps are presently mounted at or below the height of 72 inches, and that no detriment to motor vehicle safety would occur if the maximum mounting height were increased to 83 inches to allow higher mounting of turn-signals on cab-over-engine trucks, snow removal equipment, and other vehicles where a lower height may be impracticable. Tables II and IV are being revised accordingly. In Table IV the word "rear" was inadvertently omitted in that position of Column 2 establishing location requirements for side reflex reflectors, and has been reinserted.

10. *Table III.* Motorcycle Industry Council recommended that SAE Standard J584a, "Motorcycle and Motor Driven Cycle Headlamps," October 1969, be incorporated by reference rather than SAE Standard J584, April 1964. Such an amendment is beyond the scope of the original rulemaking proposal. Reference of the upgraded SAE Standard is being considered for a future rulemaking action. The petition is denied.

In addition, General Motors, Japan AMA, Motorcycle Industry Council, Harley-Davidson, and Kawasaki objected that the 300 candlepower limitation on motorcycle amber rear turn signals is unduly restrictive. Motorcycle Industry Council, Harley-Davidson, and Kawasaki objected to the spacing requirements for motorcycle turn-signal lamps. Both of these matters are still under reconsideration and will be disposed of at a later date.

In consideration of the foregoing, S4.1.1.7, S4.1.1.14, S4.1.1.16, S4.1.2, S4.3.1.8, S4.4.2, Table I, Table II, Table III and Table IV of Motor Vehicle Safety Standard No. 108 in 49 CFR 571.21 are revised. . . .

Effective date: January 1, 1972, except as otherwise noted in the text of the rule.

Issued on January 28, 1971.

Charles H. Hartman,
Acting Administrator, National Highway Traffic Safety Administration.

36 F.R. 1896
February 3, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers and Motorcycles

(Docket No. 69–18)

This notice amends Motor Vehicle Safety Standard No. 108 to delete the 300-candlepower limitation on motorcycle amber rear turn signals, to adopt an interlamp spacing of 9 inches for motorcycle rear turn signal lamps, and to extend to January 1, 1973, the effective date by which passenger cars and vehicles less than 80 inches in overall width must be manufactured with self-canceling turn-signal units.

In response to petitions for reconsideration of Motor Vehicle Safety Standard No. 108 (35 F.R. 16840), certain amendments to the standard were published on February 3, 1971 (36 F.R. 1896). Action was deferred on other petitions pending further reconsideration. The National Highway Traffic Safety Administration has concluded its review of these petitions and is further amending Standard No. 108. General Motors, Japan Automobile Manufacturers Association, Inc., and Kawasaki Motors Corp. objected that the 300-candlepower limitation on motorcycle amber rear turn signals is unduly restrictive. Since the candlepower limitation would not have become effective until January 1, 1973, and since the Administration has not proposed similar restrictions on amber rear turn signals for other motor vehicles, these petitions are granted, and S4.1.1.11 is deleted. The NHTSA will address the overall problem of candlepower limitations, along with that of rear turn signal color, in a proposal currently under formulation.

Motorcycle Industry Council, Harley-Davidson, and Kawasaki objected to the spacing requirements for motorcycle turn signal lamps and requested that the spacing recommended by the SAE, 9 inches front and rear, be adopted instead. The Administration has decided to grant the petitions insofar as they concern spacing of rear turn signals. Petitioners are concerned about the durability and injury potential of turn signal lamps spaced 12 inches apart at the rear of a motorcycle. While it appears true that wider spacing of turn signals at the rear create a greater likelihood of damage to the units should the motorcycle fall, this is not considered significant justification for spacing less than 12 inches. Rather, the crash injury problem appears of greater importance. While spacing of rear turn signal lamps at 12 inches does not appear to present a significant injury threat to pedestrians, it may present a hazard to operators and passengers when the vehicle is involved in a collision or falls over. This agency intends to evaluate motorcycle rear turn signal lamp spacing for injury potential in its motorcycle crash injury research program for the current fiscal year, and to reinstate the 12-inch requirement if such spacing does not appear to present a significant potential hazard. Table IV is hereby amended to specify 9 inches as the minimum horizontal separation distance for motorcycle turn signal lamps at the rear.

The motorcycle industry has also expressed its concern about the durability and injury potential of front turn signal lamps spaced 16 inches apart, as well as whether the spacing is justified by available data. Tests conducted by the Road Research Laboratory and SAE provide adequate support, not only for the 16-inch spacing at the front but also for the 12-inch spacing at the rear. Since front turn signal lamps are generally protected by handlebars and durability and injury potential do not appear to be significant, the Administration has decided to retain the 16-

inch spacing for motorcycle front turn signal lamps.

In addition, Citroen has brought to the attention of the Administration the fact that its vehicles exported to the United States are not equipped with, and are not currently designed to be equipped with, self-canceling turn signals. Because of the modifications required in the panel control, dashboard, and steering column, it avers that it cannot comply until January 1, 1973, and has petitioned that the effective date of S4.1.1.5 be extended . Since virtually all other motor vehicle manufacturers presently comply with this requirement, the granting of this petition would not cause a significant degradation of motor vehicle safety, and S4.1.1.5 is amended accordingly.

Finally, the word "red" inadvertently was included in the first sentence of S4.1.1.7 and is hereby deleted.

In consideration of the foregoing, § 571.21 is amended as follows:

1. S4.1.1.5 is amended to read:

S4.1.1.5 The turn signal operating unit on each passenger car, and multipurpose passenger vehicle, truck, and bus less than 80 inches in overall width manufactured on or after January 1, 1973, shall be self-canceling by steering wheel rotation and capable of cancellation by a manually operated control.

2. In S4.1.1.7 the word "red" appearing between "Class A" and "turn signal lamps" is deleted.

3. S4.1.1.11 is deleted, in S4.1.1 the reference to "S4.1.1.16" is changed to "S4.1.1.15," and S4.1.1.12, S4.1.1.13, S4.1.1.14, S4.1.1.15, and S4.1.1.16 are renumbered S4.1.1.11, S4.1.1.12, S4.1.1.13, S4.1.1.14, and S4.1.1.15 respectively.

4. In Table IV, under Motorcycles Column 3 for turn signal lamps, the dimension "2 inches" for turn signals at or near the rear is changed to "9 inches."

Effective date: January 1, 1972.

Issued on May 13, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 9069
May 19, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers and Motorcycles

(Docket No. 69–18)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 108 to delete sampling and failure-rate provisions from the tests of turn signal and hazard warning signal flashers, and to modify performance requirements for these items of motor vehicle equipment.

The notice of proposed rulemaking upon which this amendment is based was published in the *Federal Register* on February 3, 1971 (36 F.R. 1913). Standard No. 108 incorporates by reference SAE Standard J590b, "Automotive Turn Signal Flasher," October 1965, and SAE Recommended Practice J945, "Vehicular Hazard Warning Signal Flasher," February 1966. Both standards specify a test sample size and a permissible failure rate for the items tested, viz., that 50 items shall be "submitted for test," that 20 items shall be chosen from the 50, and that "at least 17 out of 20 samples" shall meet the requirements. These are the provisions whose deletion was proposed.

Careful consideration has been given to the comments received in response to the notice. Many industry comments opposed the proposal, alleging that substantially total compliance would necessitate an increase in unit cost, and arguing that the cost increase is not justified by the safety benefits to be gained. Concern was also expressed as to possible penalties that might arise from the occasional failures that are claimed by the industry to be unavoidable in items of this type.

As stated in the February 3 notice of proposed rulemaking, the NHTSA considers permissible failure rates to be contrary to both the letter and the intent of the National Traffic and Motor Vehicle Safety Act. Manufacturers are required to use due care to ensure that all their products meet the requirements of the standards. The assessment of penalties for test failures is not automatic, however, but is made after a review of all the facts, with a view to determining whether due care was used in accordance with sound engineering and manufacturing principles. The sampling and failure-rate provisions are accordingly hereby deleted from the requirements in Standard No. 108 for turn signal and hazard warning signal flashers.

The NHTSA has determined that the design and production problems associated with the manufacture of thermal flashers are such that total compliance with current performance and durability test requirements is not practicable. Therefore, modifications have been made in starting time, voltage drop, flash rate and percent current "on" time for performance tests, and in the duration and cycle of operation for durability tests. For example, the previously required performance range of 60 to 120 flashes per minute is broadened to 40 to 140 flashes per minute, and the percentage of time during a flash cycle that flasher contacts are required to be engaged, previously a range of 30 percent to 75 percent, is now 25 percent to 80 percent. The durability test for turn signal flashers will be continuous for 25 hours, rather than consisting of an on-off cycle for 200 hours. The durability test for hazard warning signal flashers is reduced to 12 hours from 36 hours. This agency has concluded that the net effect of these modifications is not a lessening of motor vehicle safety, since the minimum performance of flashers is substantially upgraded by requiring compliance of every flasher manufactured, rather than of only 17 of every 20 tested.

To implement the deletion of sampling and failure-rate provisions and the modification of the previous requirements, the NHTSA is amending Standard No. 108 to delete existing references to SAE Standard J590b and SAE Recommended Practice J945, and to adopt a new paragraph S4.6, *Turn signal flashers; hazard warning signal flashers*, that incorporates the new requirements.

In consideration of the foregoing, 49 CFR 571.21, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices and Associated Equipment*, is amended. . . .

Effective date: January 1, 1973. Manufacturers commented that the proposed effective date of January 1, 1972, was impracticable in view the necessity to evaluate and adopt new flasher and switch designs meeting the requirements. In light of the time needed for changes in design and preparation for production, the Administrator has found, for good cause shown, that an effective date later than one year from the date of issuance is in the public interest.

Issued on August 20, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 17343
August 28, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 69-18; Notice 6)

Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, was amended on August 28, 1971 (36 F.R. 17343) to revise performance requirements for turn signal and hazard warning signal flashers. Thereafter petitions for reconsideration of the amendment were filed by Chrysler Corporation, Ideal Corporation, Signal-Stat Corporation, and Stewart-Warner Corporation. This notice responds to these petitions. This notice also amends Standard No. 108 to allow compliance with paragraph S4.6 of Standard No. 108a (§ 571.108a), at the option of the manufacturer, before January 1, 1973.

In its petition for reconsideration, Chrysler noted that "the amendment deletes the sampling provision and imposes new, presumably less stringent, but unique performance requirements" and commented that "while this change was announced in principle in prior rulemaking actions, the details of the new performance requirements were specified for the first time in this amendment." Claiming that its suppliers have not had time to evaluate their ability to comply with the new requirements, Chrysler petitioned that the amendment be withdrawn and reissued as a notice of proposed rulemaking. Sampling and failure-rate provisions were initially deleted in a rule published October 31, 1970 (35 F.R. 16840), which amended Standard No. 108 in various ways. Then, in response to objections that the action had not been previously the subject of a notice of proposed rulemaking, the action was revoked, a new notice of proposed rulemaking to that effect was issued on February 3, 1971 (36 F.R. 1913), and all interested persons were given full opportunity to comment. After careful consideration of the comments received, the agency again published a rule on August 28, 1971 (36 F.R. 17343), which deleted the sampling and failure-rate provisions. The rule also relaxed somewhat some of the quantitative levels of required performance. Thereafter, in accordance with the agency procedural rules, petitions for reconsideration of the rule were received and considered. The NHTSA considers that these actions have considerably exceeded the requirements of the Administrative Procedure Act, 5 U.S.C. 553, that notice and opportunity for comment be provided giving "either the terms or substance of the proposed rule or a description of the subjects and issues involved," and finds that no significant further benefit will be gained by reopening the matter for still another round of comments. Chrysler's petition is therefore denied.

Stewart-Warner submitted a general petition for reconsideration of the amendment, believing that "the amendment can allow unsafe conditions to come into existence." While it is true that the new performance requirements, on a strictly quantitative basis, may be viewed as less stringent than the old, the agency has concluded that the net effect of the amendment, considering the removal of the permissible failure rate, is not a lessening of the safety performance of these items.

Signal-Stat and Ideal petitioned that paragraph S4.1.1 be amended to require that all lighting equipment designed to conform to Standard No. 108 be "manufactured in accordance with sound engineering, manufacturing, and quality control principles." The basis for this request, in Signal-Stat's words, is that "while it is not possible to assure the durability of any single individual flasher, it is possible to reasonably produce requirements on a statistical basis in mass production," and that "the only feasible and practical 'due care' and production means available, dictated by sound quality control principles, is to evaluate devices of volume on a statistical basis." The NHTSA has generally no objection to the above statements, although they are not necessary or appropriate for inclusion in the standard itself. The agency does not have any intent of outlawing designs such as thermal flashers, that have been previously used to satisfy the requirements in question. It also recognizes fully that with high-volume, low-cost items of equipment such as flashers, sample testing by the manufacturer may be the only practicable means of quality control. It can further be stated that in the case of such items, an occasional failure of NHTSA compliance tests, representing a very small percentage of production, will not necessarily result in a determination that there has been a violation of the Act. The question in each case is whether the manufacturer exercised due care; wherever a manufacturer can establish that he has exercised due care, he will not be in violation of the Act. The petitions of Ideal and Signal-Stat are therefore denied.

Ideal has also requested an interpretation that it be allowed to manufacture flashers before January 1, 1973, that conform to the revised requirements. To encourage manufacturers to conform at an early date, the NHTSA is amending Standard No. 108 to allow compliance with paragraph S4.6 of Standard No. 108a (§ 571.108a), at the option of the manufacturer, between January 1, 1972, and January 1, 1973.

This notice also corrects a paragraph numbering error in both standards.

In consideration of the foregoing, 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, *Lamps*, *Reflective Devices*, *and Associated Equipment*, is amended. . . .

Effective date: January 1, 1972. Because the amendments create no additional burden or obligation, and permit an early implementation of revised performance requirements, the Administrator has found for good cause shown that an effective date earlier than one hundred eighty days after issuance of this notice is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on December 22, 1971.

Douglas W. Toms
Administrator

36 F.R. 25013
December 28, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–18; Notice 7)

The purpose of this notice is to specify a permissible method of certifying replacement lighting equipment for vehicles manufactured on or after January 1, 1972, to conform to Federal Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment.*

Section 114 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1403) requires every manufacturer or distributor of motor vehicle equipment to "furnish to the distributor or dealer at the time of delivery of such . . . equipment by such manufacturer or distributor the certification that each such . . . item of motor vehicle equipment conforms to all applicable Federal motor vehicle safety standards . . . [S]uch certification may be in the form of a label or tag on such item or on the outside of a container in which such item is delivered." Thus, manufacturers of equipment to which a safety standard applies generally certify the equipment by labeling either the equipment or its container. In the case of Standard No. 109, *New Pneumatic Tires*, certification labeling on the items themselves is required by the standard.

Normally, the certification responsibility of a distributor is met by the distributor's delivery of the manufacturer's certification statement to the dealers to whom he sells. Although no separate statement is necessary, the delivery of the manufacturer's certification is considered a legal act by which the distributor makes the certification required by the statute.

With the extension of Standard No. 108 to items of replacement equipment, some difficulties in this scheme may arise where small items are not individually packaged. Automotive parts distributors commonly sell single items of equipment "over the counter" to local garagemen, who are dealers within the meaning of the Act. If these items are not separately packaged and not marked with a certification, the distributor must, under the Act, certify the items to the dealer. Although there is a variety of ways in which the distributor can do this, it is probably unrealistic to expect a separate certification to be properly and consistently made at this level. Manufacturers of lighting equipment have recognized the problem, and have suggested that they be permitted to certify their equipment by affixing the symbol DOT to each item of equipment.

This request has been found to have merit, and S4.7 of Standard No. 108, 49 CFR 571.108, is hereby amended to permit manufacturers to certify lighting equipment items by placing the symbol "DOT" directly on the item, if they choose to do so.

In consideration of the foregoing, S4.7 of 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, is amended. . . .

Effective date: January 12, 1972. Because the amendment creates no additional burden or obligation and permits an optional method of compliance with an existing requirement, the Administrator has found for good cause shown that an immediate effective date is in the public interest.

This notice is issued under the authority of sections 103, 112, 114 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on January 6, 1972.

Douglas W. Toms
Administrator

37 F.R. 445
January 12, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69-18; Notice 8)

This notice amends 49 CFR 571.108 and 571.108a, Motor Vehicle Safety Standard No. 108 and No. 108a, *Lamps, Reflective Devices, and Associated Equipment*, to permit off-center spacing of identification lamps on vehicles 80 inches or more in overall width.

Utility Trailer Manufacturing Co., has petitioned for the reinstatement of former requirements for the location of identification lamps. Before January 1, 1972, the three-lamp cluster was required to be mounted "as close as practicable to the vertical centerline." On vehicles manufactured on or after that date, the three identification lamps must be mounted "one on the vertical centerline, and one on each side of the vertical centerline." A type of trailer manufactured by Utility mounts a lock on the centerline of the trailer with the lock socket at the rear header. Typically the header is shallow and does not allow room to mount the gasket seal, the center lock socket, and an identification lamp all "on the vertical centerline." Extensive retooling is necessary for compliance, and apparently would cause hardship to Utility and other manufacturers of this type of trailer. The Administration believes that permitting the lamp cluster to be mounted slightly off center would not compromise motor vehicle safety, and accordingly is returning to the original mounting requirement for all vehicles required to have identification lamps.

In consideration of the foregoing, the specifications for "Identification Lamps" in Table II, Location of Required Equipment, 49 CFR § 571.108, and 49 CFR § 571.108a, are revised....

Effective date: January 25, 1972. Because the amendments create no additional burden or obligation, the Administrator finds for good cause shown that an immediate effective date is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on January 19, 1972.

Douglas W. Toms
Administrator

37 F.R. 1107
January 25, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 72-4; Notice 2)

This notice amends 49 CFR § 571.108 and § 571.108a, Motor Vehicle Safety Standard Nos. 108 and 108a, *Lamps, Reflective Devices, and Associated Equipment*, to revise the test method for reflex reflectors.

On April 8, 1972, the National Highway Traffic Safety Administration proposed (37 F.R. 7107) that the applicable SAE standard for reflex reflectors incorporated by reference in Table I and Table III of Standards No. 108 and 108a be SAE Standard J594e, "Reflex Reflectors," March 1970, to replace J594d, March 1967. All comments received were in favor of the proposal and the standards are being amended accordingly. The effect of the amendment is to permit photometric testing at a range around a test point if speculiar reflection is encountered at the test point itself. The amendment does not impose a new performance requirement but allows a more realistic method of testing than J594d, which prohibited testing at other than the specified test points, and which had the effect of causing a technical noncompliance if there were specular reflection at any test point.

Paragraph S4.3.1.2 has been incorporated into J594e and is being deleted from the text of Standard No. 108a. This paragraph specifies that, for purposes of photometric testing, the axis of the side reflex reflectors shall be perpendicular to a vertical plane through the longitudinal axis of the vehicle.

In consideration of the foregoing, 49 CFR § 571.108 and § 571.108a, Motor Vehicle Safety Standards 108 and 108a, are revised . . . .

Effective date: Standard No. 108: Sep. 1, 1972; Standard No. 108a: January 1, 1973. Because the amendments create no additional burden and modify a test procedure currently in effect, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on July 28, 1972.

Douglas W. Toms
Administrator

37 F.R. 15514
August 3, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–18; Notice 11)

This notice amends 49 CFR Part 571, by revoking Section 571.108a, Motor Vehicle Safety Standard No. 108a, *Lamps, Reflective Devices, and Associated Equipment* and deleting a conforming amendment to Standard No. 108, in accordance with a decision of the U.S. Court of Appeals.

Standard No. 108a was established on December 2, 1971 (36 F.R. 22909), to clarify requirements for turn signal and hazard warning signal flashers effective January 1, 1973. These requirements were established by an amendment published on August 28, 1971 (36 F.R. 13743). The amendment deleted sampling and failure rate provisions from the tests for these items of motor vehicle equipment, and modified the performance requirements.

Pursuant to section 105(a)(1), of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1394(a)(1)), Wagner Electric Corporation petitioned for review of the August 28, 1971 order in the United States Court of Appeals for the Third Circuit. On August 29, 1972, the court granted the petition, set aside the order and remanded the matter to the National Highway Safety Administration for new rulemaking proceedings consistent with the court's views. (Wagner Electric Corporation v. Volpe, No. 71–1976 (3d Cir. 1972))

By this notice, the NHTSA deletes from the Code of Federal Regulations the amendment set aside by the Court's order. The deleted provision essentially constituted the version of the standard that was to become effective January 1, 1973, (Standard No. 108a) along with paragraph S4.1.1.16 of Standard No. 108, which allowed manufacturers to conform to the new requirements before that date.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: This notice reflects the order of the U.S. Court of Appeals for the Third Circuit, whose mandate was issued September 19, 1972, and is effective as of that date.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on September 28, 1972.

Douglas W. Toms
Administrator

37 F.R. 20695
October 3, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 71-21; Notice 3)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to modify the method by which conformity of certain lamps to photometric requirements is determined. A notice of proposed rulemaking on this subject was published on November 30, 1971 (36 F.R. 22763).

Standard No. 108 requires that tail lamps, stop lamps, parking lamps, and turn signal lamps meet minimum photometric candlepower requirements at up to 27 individual test points. If a lamp fails to meet the minimum requirement at any test point, the lamp does not conform to Standard No. 108 even though it may exceed the specified minimum at all other test points.

As noted in the November 30, 1971 proposal, this requirement appeared unnecessarily severe, since deviances at individual test points are generally not great enough to be discernible to the human eye. The method proposed and adopted sets up seven groups of test points, as shown in Figure 1, each group containing from three to five test points. The groups include requirements for devices with one, two, or three separately lighted compartments, and multiple lamps used in an array to perform a function at a single design location. The minimum candlepower requirement for any single group is the sum of the minimum candlepower specified in the applicable SAE standards for individual test points within the group. Therefore, there will be no failure to conform to Standard No. 108 as long as the sum of the candlepower measured at all test points within a group equals or exceeds the required minimum figure for that group. The amendment will not have a significant effect on motor vehicle safety and is designed to set up a more realistic and cost effective method of determining compliance with photometric requirements.

Two aspects of the proposal are not adopted in the amendment. The proposal would have set a floor of 60 per cent on the amount by which the measured candlepower at a single test point could fail to reach the required minimum for that test point. The same rationale governing the overall proposal dictated that the floor not be adopted: as long as the sum of the test points within a group meets the overall minimum for the group, the difference in illumination at any discrete test point is unlikely to be great enough to be discernible.

Secondly, the proposal would have required that clearance, side marker, identification, and parking lamps have minimum candlepower equivalent to tail lamps. This proposal has not been adopted. Comments indicated that the increase in candlepower would be so significantly greater as to cause a glare problem. The group test concept has been adopted for parking lamps, but not for clearance, side marker, identification lamps, which retain minimum candlepower for all test points.

In addition, a deferred effective date has been adopted for increased grouped candlepower requirements applicable to tail, stop and turn signal lamps with two or three lighted compartments, and to lamp arrangements where two or three lamps are used to perform a single function in a single design location. These requirements have been made effective September 1, 1974, in order to provide sufficient leadtime for redesign and retooling. In the interim, beginning January 1, 1973, such lamps or lamp arrangements may meet the grouped requirements applicable to single compartment and single stop and turn signal lamps.

It was also proposed that minimum candlepower requirements be specified for tail lamps, stop lamps and turn signal lamps, measured at a 45-degree angle where any SAE Standard incorporated by reference required visibility of the lamps at a 45-degree angle. Objections were raised that the proposed values were too high and that there was no safety benefit in requiring them. The NHTSA, on the basis of its analysis of cost benefit factors, has not adopted the proposal.

The amendment does not adopt the proposal that both red and yellow rear turn signal lamps have the same maximum candlepower limitation. The subject of the color of rear turn signal lamps will be addressed in a forthcoming notice, in Docket No. 69–19.

The SAE standard applicable to parking lamps in Table III has been changed to SAE Standard J222, "Parking Lamps (Position Lamps)," December 1970. Paragraph S4.1.1.11, which specifies photometric values for parking lamps, is deleted as these values are incorporated in the revised SAE standard.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is revised....

Effective date: January 1, 1973. Because the amendment creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392 and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on October 2, 1972.

Douglas W. Toms
Administrator

37 F.R. 21328
October 7, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 72–5; Notice 2)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to specify stop and turn signal lens area requirements that are identical for all motor vehicles less than 80 inches in overall width.

As the NHTSA explained in its proposal published April 8, 1972 (37 F.R. 7107), Standard No. 108 requires (Table III) passenger cars, multipurpose passenger vehicles, trucks, and buses to be equipped with "Class A" turn signal lamps. Class A lamps prior to Standard No. 108 were generally found only on vehicles whose overall width is 80 inches or more. Class A lamps differ from Class B lamps in having a minimum effective projected illuminated area of 12 square inches rather than 3½ square inches. Paragraph S4.1.1.7 of Standard No. 108, however, permits passenger cars to meet Class A photometrics through an effective projected illuminated area not less than that of a Class B lamp (3½ square inches). The NHTSA, in response to a petition from Jeep Corporation, proposed that this exception be provided for all vehicles less than 80 inches in overall width, instead of being limited to passenger cars, and that stop lamps be included as well.

The comments received supported the proposal. Recommendations were also made as to standardization of lens area and identification of lamps providing Class A photometric values. These will be treated as suggestions for future rulemaking since they were beyond the scope of the proposal.

In consideration of the foregoing, the first sentence of paragraph S4.1.1.7 of 49 CFR 571.108, Standard No. 108, is revised . . . .

Effective date: January 1, 1973. Because the amendment relaxes a requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407), and the delegation of authority at 49 CFR 1.51.

Issued on: October 26, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 23272
November 1, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 71–21; Notice 4)

This notice amends 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to specify minimum photometric-candlepower requirements for motorcycle turn signal lamps.

Standard No. 108 was amended on October 7, 1972 (37 F.R. 21328), effective January 1, 1973, to specify, in part, that turn signal lamps are not required to meet the minimum photometric values at each test point specified in Table 2 of SAE Standard J575d, "Tests for Motor Vehicle Lighting Devices and Components," if the sum of the candlepower measured at the test points within the groups listed in Figure 1 is not less than the sum of the candlepower values for such test points specified in J575d. Effective January 1, 1973, Class B turn signal lamps are required on motorcycles, and the minimum photometric candlepower values for such lamps are one-half those required for Class A turn signals. The amendment failed to make this distinction, and this notice corrects the omission.

In consideration of the foregoing, paragraph S4.1.1.12 of 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is amended . . . .

Effective date: January 1, 1973. Because the amendment creates no additional burden, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on November 21, 1972.

Douglas W. Toms
Administrator

37 F.R. 25235
November 29, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 69–18; Notice 14)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 8, to delete the requirements of the warpage tests for plastic lenses used on lamps.

The NHTSA proposed on July 7, 1972 (37 F.R. 13350), that the lens warpage test be deleted from the motor vehicle lighting standard. The test requirement itself, as contained in an SAE Standard incorporated by reference, lacked objectivity, in that it prohibited warpage that would "affect the proper functioning of the device" without further clarification. The lens warpage test did not appear to add significantly to motor vehicle safety.

Comments to the docket were divided, some confirming the NHTSA position on both issues. Others objected, suggesting that the agency seek to establish objective compliance criteria. On review of all data and arguments, the NHTSA finds that a safety problem that would justify the development of such a requirement has not been demonstrated.

In the future, if serious problems of lens warpage arise, they may be dealt with immediately as safety-related defects under section 113 of the National Traffic and Motor Vehicle Safety Act, and steps can be taken to develop and promulgate an objective test.

In consideration of the foregoing, 49 CFR § 571.108 is amended . . . .

Effective date: Jan. 1, 1973. Because this amendment relieves a restriction and creates no additional burden, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on December 29, 1972.

Jack L. Goldberg
Acting Administrator

38 F.R. 743
January 4, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 71-21; Notice 6)

This notice denies petitions for reconsideration of an amendment to Federal Motor Vehicle Safety Standard No. 108 published on October 7, 1972, that modified the method by which conformity of certain lamps to photometric requirements is determined.

The National Highway Traffic Safety Administration amended 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, on October 7, 1972, (37 F.R. 21328) to allow photometric conformance of parking lamps, taillamps, stop lamps, and turn signal lamps to be based upon the sum of values derived from grouping individual test points rather than upon a requirement of conformance at each test point. Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the amendment were filed by American Motors Corporation, Ford Motor Company, General Motors Corporation, SWF-Spezial fabrik fur Autozubehor Gustav Rau GmbH, and Volkswagen of America, Inc. Petitions raising the same issues but not timely filed were submitted by Automobiles Peugeot on behalf of the Association Peugeot-Renault and Westfalische Metall Industry KG. Chrysler Corporation submitted a request for an interpretation. The Administration has declined to grant requested relief.

1. *Inclusion of SAE Recommended Practice J256.* All petitioners except General Motors asked for adoption in its entirety of SAE Recommended Practice J256, "Service Performance Requirements for Motor Vehicle Lighting Devices," July 1971. Petitioners complain that the NHTSA adopted the grouping concept and photometric values of Table I and Table 3 of the Practice without including a correction adjustment factor or a tolerance for maximum photometric values. SAE J256 permits an adjustment in lamp orientation from design position not to exceed 3 degrees in determining compliance with photometric requirements. SAE J256 also permits a tolerance of 10 per cent in determining whether group photometric requirements are met. It further provides that the candlepower of parking lamps, taillamps, stop lamps, and turn lamps shall not exceed 120 per cent of the maximum values specified in appropriate SAE Standards. In support of their request petitioners argue that a readjustment factor is necessitated by the difficulties that test laboratories experience in insuring that lamps of complex and varied shapes are mounted with accuracy in the design position. Tolerances in candlepower output are requested because of variations in test lamp bulbs, and in manufacture and assembly of the lamps themselves.

When Standard No. 108 required compliance at every test point, the SAE Standards incorporated by reference did not permit the tolerances that petitioners request. Compliance by meeting minimum group totals rather than compliance at each test point is intended to insert a factor to compensate for those variations in test methods and manufacture that apparently concern industry. The tolerances in the SAE Recommended Practice represent a further lowering of the quantitative performance requirements. The NHTSA has determined that no sufficient reasons have been given to lower these requirements further, and that it is not in the interest of motor vehicle safety to do so. The petitions are denied.

2. *Excluded lamps.* General Motors requests the inclusion in the group testing concept of clearance lamps, side marker lamps, and identification lamps, as originally proposed by NHTSA.

GM's petition is denied. Under the proposal, photometric requirements for clearance, side marker, and identification lamps would have been increased, and identical to those for parking lamps and taillamps. But the proposed values were not adopted, and these lamps were not included in the group concept. The NHTSA believes that the group concept is inappropriate for lamps of low candlepower, and that requirements should be met at each test point. The photometric requirements for clearance, side marker, and identification lamps, are minimal in nature and identical at all test points.

3. *Interpretations.* Chrysler Corporation has asked whether "the maximum values provided in Figure 1 may be used in place of the maximum photometric values set out in paragraph S5.2," which states in pertinent part that "the maximum photometric candlepower values for one-compartment and two-compartment stop lamps shall be 300 candlepower." The answer is yes, and paragraph S5.2 is being deleted.

Chrysler has also asked whether "subscripts (f) and (g) of Table 2 of . . . SAE Standard J575d applies to the measurement of the maximum values in . . . Figure 1 . . . ". There is no footnote (g) in J575d, and footnote (f) does apply.

Clarification has also been requested as to whether the maximum tail lamp values in Figure 1 are intended to apply at test points below the horizontal. The answer is no; the limitation, as was true before the amendment, is restricted to the horizontal and above.

In consideration of the foregoing, section S5 of 49 CFR § 571.108, Motor Vehicle Standard No. 108 is amended by removing the designation "S5.1" and deleting paragraph S5.2.

Effective date: February 5, 1973. Because the amendment clarifies an ambiguity and creates no additional burden, good cause has been shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 30, 1973.

Douglas W. Toms
Administrator

38 F.R. 3331
February 5, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 71-21; Notice 7)

This notice corrects the amendment to 49 CFR § 571.108 published on February 5, 1973 (38 F.R. 3331) that removed the designation "S5.1" and deleted paragraph S5.2 from Motor Vehicle Safety Standard No. 108.

The amendment inadvertently overlooked the fact that a new paragraph S5.3, concerning lens warpage, had been added to Standard No. 108 on January 4, 1973 (38 F.R. 743). The notice published on February 5, 1973 should have retained the designation of S5.1, deleted S5.2 and renumbered S5.3.

In consideration of the foregoing, section S5 of 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, is amended by adding the designation "S5.1" to the first paragraph, and changing the designation of paragraph S5.3 to read "S5.2".

Effective date: February 28, 1973. Because the amendment corrects an error and creates no additional burden good cause has been shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51).

Issued on February 21, 1973.

Douglas W. Toms
Administrator

38 F.R. 5338
February 28, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 71-21; Notice 6)

This notice amends the test procedures relating to bulbs in Motor Vehicle Safety Standard No. 108, effective January 1, 1974.

The National Highway Traffic Safety Administration proposed on December 1, 1972 (37 F.R. 25535) to amend two test procedures relating to bulbs. As the NHTSA explained:

> "At the present time, test bulbs must be 'operated at their rated mean spherical candlepower unless otherwise specified.' Not all bulbs have been assigned a mean spherical candlepower rating. The proposal specifies that when no rating has been assigned by the bulb manufacturer or the SAE or, if the lamp is sealed and the bulb cannot be replaced, the bulb shall be operated at design voltage. Secondly, instances have arisen where noncompliance of lamps could not be proven in marginal cases because of the tolerances permitted in test bulbs. The notice seeks to render test results more reproducible by proposing that the filaments of test bulbs (other than sealed-in bulbs) be positioned within ±.010 inch of the nominal design position specified in SAE Standard J573d, "Lamp Bulbs and Sealed Units," or by the bulb manufacturer. Other requirements of SAE Standard J575d, incorporated by reference into Standard No. 108, remain applicable."

Comments generally supported the notice, and the standard is being amended as proposed. The chief objection voiced was that it is difficult to obtain test bulbs at the proposed filament location tolerances. The NHTSA finds, however, that these difficulties are outweighed by the need for objective and repeatable tests. Moreover, while the NHTSA intends to use a bulb with the filament positioned within ±.010 inch of the design position for its compliance tests, a manufacturer is not required to do so. If the manufacturer has test data to show a correlation between a Standard No. 108 test bulb and one used by him outside the ±.010-inch tolerances, his certification could be based on the test data and the correlation factor, assuming that that factor indicated compliance. Similarly if it can be demonstrated that the lamp complied using test bulbs having filament locations on both the plus and minus sides of the design position, outside the ±.010 tolerance but within the other tolerances of J573, compliance could be certified.

The NHTSA would also like to make clear that only the filament in the test bulb for the function tested need meet the .010-inch tolerance. For example, if a combination tail lamp/stop lamp is being tested for the tail lamp function, the stop lamp filament need not be within the tolerance, and a bulb with a correctly positioned filament may subsequently be substituted for the stop lamp test.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is revised by adopting new paragraphs S4.1.1.19 and S4.1.1.20. . . .

Effective date: January 1, 1974.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 38 F.R. 12147)

Issued on June 15, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 16230
June 21, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–19; Notice 6)

This notice amends the requirements of Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices and Associated Equipment* applicable to trailers that are either less than 6 feet in overall length or 30 inches in overall width.

On October 25, 1972 the National Highway Safety Administration proposed (Docket No. 69–19; Notice 3, 37 F.R. 22801) as part of a comprehensive rule making action that small trailers need not be equipped with the complement of lighting devices required of larger trailers. The agency proposed that a trailer less than 30 inches wide may be equipped with only one of each of the following devices located at or near its vertical centerline: tail lamp, stop lamp, and rear reflex reflector. The NHTSA also proposed that a trailer that is less than 6 feet in overall length, including the trailer tongue, need not be equipped with front side marker lamps and front side reflex reflectors. In the opinion of the NHTSA this equipment is sufficient to meet the needs of motor vehicle safety. Commenters generally agreed, and Standard No. 108 is being amended as proposed. Two suggested that two rear reflectors be required. The amendment, which is phrased as an option, does not preclude a two-reflector configuration if the manufacturer wishes. In accordance with several comments, the amendments, which relieve a restriction, are being made effective 30 days after publication of this notice in the *Federal Register*.

Several amendments of Standard 108 are also being made by this notice to reflect the expiration of the stated period for certain compliance options. Paragraphs S4.1.1.13, S4.1.1.14, and S4.1.1.15 of Standard 108 deferred compliance with amended backup lamp and license plate lamp requirements, and with turn signal requirements for motorcycles, until January 1, 1973, at the manufacturer's option. Since these options are no longer permissible, the paragraphs are being deleted. Rather than redesignating the succeeding subparagraphs of S4.1.1 as has been the practice in the past, the NHTSA, in order to eliminate confusion, intends to maintain the current order and adopt new numbers in successive order for new requirements. A similar policy has been adopted with respect to footnotes in the Tables. Thus, the trailer lighting amendments adopted by this notice are designated S4.1.1.17 and S4.1.1.18. S4.1.1.16 is amended to delete the expired option allowing use of Class B turn signals on vehicles less than 80 inches wide designed to complete a durability test of 100,000 cycles. Appropriate amendments reflecting these deletions are made to the footnotes and references in Tables I, III, and IV of the standard.

In consideration of the foregoing, 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, is amended. . . .

Effective date: July 23, 1973. Because the amendment in part relieves a restriction and creates no additional burden, and in part is administrative in nature, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Section 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 USC 1392, 1407; delegation of authority at 38 F.R. 12147.)

Issued on June 15, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 16875
June 27, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69-19; Notice 7)

This notice amends 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to specify requirements for rectangular headlamps that may be used as an option in a four-headlamp system until September 1, 1976. The notice also sets forth NHTSA policy concerning rectangular headlamps after such time.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking (Docket No. 69-19; Notice 5) published on June 8, 1973 (38 F.R. 15082), and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to a petition by General Motors. Under it, a rectangular headlamp approximately 6¾ in. by 4¼ in. would be permissible in five headlamp types (Types 1A through 5A) proposed for the two four-lamp front lighting Systems B and C proposed in Notice 3 to Docket No. 69-19 (37 F.R. 22801). Photometric values based upon Notice 3 were also proposed. As Notice 5 was technically an amendment of Notice 3, other headlighting requirements of the earlier proposal, such as those affecting mounting and aiming, were incorporated by reference.

Based upon comments to the docket and consideration of the issues involved, this amendment allowing an optional rectangular headlamp system differs from the proposal in several respects. The most important of these is its incorporation into Standard No. 108 as it is currently in effect, rather than into the amendment proposed by Notice 3. Thus, only two of the five proposed rectangular headlamp types have been adopted, and the photometric, mounting, and other requirements are with slight exceptions those that are presently required for a four-headlamp system. Dimensions are slightly different from those proposed, at the request of General Motors which has modified its original experimental design.

The comments received expressed a variety of opinions on the rectangular headlamp proposal. The most common point of agreement was that there is no clear safety benefit or detriment in the use of rectangular headlamps. The NHTSA expressed concern in the notice "that there should not be such a proliferation of headlamp shapes and sizes that the motorist who has an immediate need to replace a headlamp has difficulty in finding one," and this concern was shared by several commenters. The points were also made that rectangular headlamps may be more expensive than conventional ones, and that they cannot be mechanically aimed with equipment currently in use. Finally, the question was raised whether rectangular headlamps might encounter more service performance difficulties than round ones.

Commenters generally supported the relief of a design restriction imposed by Standard No. 108, and this has been a prime determinant in the NHTSA's decision to permit certain rectangular headlamps. The NHTSA has determined that, by reducing the proposed number of types of rectangular headlamps from five to two, there will not be an undue proliferation of headlamps on the replacement market. Since these headlamps are optional and not mandatory, their cost is not a major relevant factor to be considered in determining whether they should be permitted. Rectangular headlamps can be optically aimed, the method in predominant use in State motor vehicle inspections, and thus the NHTSA did not find the difficulty of mechanical aiming a persuasive argument. In addition, mechanical aimers capable of aiming rectangular headlamps are under development and should shortly be commercially available. The NHTSA is, of course, concerned as to whether the rectangular headlamps will encounter more service difficulties than conventional ones, but does not believe that the issue can be proven until such units are mass-produced and actually in service.

These amendments to Standard No. 108 represent an interim rather than a final decision on the issues of rectangular headlamps and appropriate dimensions. During 1974 and 1975 NHTSA expects the world motor vehicle industry, through international standards organizations and regular trade and professional associations, to arrive, if possible, at a consensus for one set of requirements, including dimensions for rectangular headlamps. Late in 1975, the NHTSA intends to announce its final decision on the matter: whether to remain with the requirements and dimensions adopted in this notice, to propose and adopt others, or to revoke the option. The agency at this point is not committing itself either to adopt any consensus dimensions or to perpetuate the ones desired by General Motors, though the field experience with such lamps over the next two years may be expected to have some influence in the final decision. Adoption of these optional dimensions by a manufacturer during this interim period is at his own risk, and the cost of changing over from interim to permanent dimensions, if different, in 1977 model year tooling will not be considered a material factor in the decision on permanent dimensions. It is planned that the interim amendment will be in effect through August 31, 1976, and that no petitions will be entertained for variant headlamp dimensions or system configurations before the end of that period, to avoid multiplying stock items and disrupting supply channels.

In consideration of the foregoing, 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, is amended by adding a new paragraph S4.1.1.21. . . .

Effective date: January 1, 1974. Because the amendment creates an optional system without imposing new mandatory requirements on any person it is found for good cause shown that an effective date earlier than 180 days after the issuance of the amendment is in the public interest.

(Secs. 103, 119 Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on November 23, 1973.

James B. Gregory
Administrator

38 F.R. 33084
November 30, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 72-22; Notice 2)

This notice amends Federal Motor Vehicle Safety Standard No. 108 to modify requirements for lighting equipment on mobile structure trailers.

The National Highway Traffic Safety Administration proposed on September 30, 1972 (37 F.R. 20573) that mobile structure trailers (commonly known as mobile homes) need be equipped only with tail lamps, stop lamps, and turn signal lamps if the manufacturer so chooses. As the agency observed in support of its proposal:

> "Since January 1, 1968, mobile homes towed on their own wheels have been categorized as 'trailers' by the Federal motor vehicle safety standards, and required to conform to applicable Federal motor vehicle lighting specifications. Pursuant thereto, mobile homes in transit have been equipped with the full complement of trailer lighting equipment required by Standard No. 108: Tail lamps, stop lamps, license plate lamps, reflex reflectors, side marker lamps and reflectors, identification lamps, clearance lamps, and turn signal lamps.
>
> "Because of the limited time a mobile home is on the public ways, manufacturers have been advised that compliance may be achieved by use of a lighting harness removable upon completion of transit. The Trailer Coach Association alleges that installation and removal expense of the wiring harness adds needless cost to 'the only low cost housing available to the majority of people today.' It has petitioned for an amendment of the lighting requirements such that reflex reflectors, license plate lamps, identification lamps, clearance lamps, and side marker lamps would not be required on mobile structure trailers 'when moved under the authority of State issued permits whose regulations specifically prohibit movement during hours of darkness.' . . .
>
> "Available information indicates that a mobile structure trailer, defined in 49 CFR 571.3 as 'a trailer that has a roof and walls, is at least 10 feet wide, and can be used off road for dwelling or commercial purposes,' cannot move over the public roads of any State without a permit containing the condition that the trailer shall not be moved during hours of darkness. In many jurisdictions, movement is also prohibited during inclement weather or under other conditions of reduced visibility. The safety benefit of requiring the full complement of trailer lighting equipment appears negligible under these circumstances, and unnecessary for the safety of the motoring public."

The proposal was supported by numerous mobile home manufacturers and manufacturers associations, and opposed by a number of manufacturers and suppliers of lighting equipment, by a consumer group, one State, and other interested persons. Those who opposed the proposal argued that the presence of large mobile homes on the public highway is a traffic hazard *per se*, and that a full complement of lights should be required regardless of restrictions on movement. Comments were made that the existence of State laws did not necessarily preclude movement of mobile homes either at night or during periods of inclement weather. Most States, however, require special warning to motorists when mobile structure trailers exceeding a specified width and length are being transported. This warning may be in the form of flagmen, escort vehicles, flags on the towing vehicle, and "wide load" signs.

The NHTSA has concluded that motor vehicle safety does not require a full complement of lighting devices on mobile structure trailers, whose use of the roads, as a class, is infrequent, and confined to daylight hours, when identification lamps, clearance lamps, and side marker lamps are not normally in use. Accordingly, the standard is being amended to specify that the only required lighting equipment for these vehicles is stop lamps, turn signal lamps, tail lamps, and rear reflex reflectors. The NHTSA has decided to include rear reflex reflectors as required equipment to provide some measure of protection when a mobile structure trailer is parked on the road shoulder at night or during periods of reduced visibility. Mobile structure trailers in interstate transit, however, must continue to meet the requirements of the Bureau of Motor Carrier Safety (49 CFR 393.17, 393.25).

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is revised by adding a new section S4.1.1.25. . . .

Effective Date: May 29, 1974. Because the amendment relieves a restriction, and creates no additional burden, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on April 24, 1974.

James B. Gregory
Administrator

39 F.R. 14946
April 29, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 73–25; Notice 2)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, to: (1) update the incorporated SAE standard on clearance lamps, (2) group test points for determining photometric conformance of backup lamps, (3) identify load requirements for testing variable load turn signal flashers, and (4) increase the allowable voltage drop in testing turn signal and hazard warning signal flashers.

These amendments are responsive to petitions by Truck Safety Equipment Institute, Signal Stat Corporation, Sylvania GTE and Hope-Tronics, Ltd., as discussed in the notice proposing the amendments, published on November 2, 1973 (38 F.R. 30280). The comments received in response to the notice were unanimous in supporting the change from SAE J592c to J592e as the referenced standard for clearance lamps, and in adopting the grouping of test points to determine compliance of backup lamps with photometric requirements. Comments also unanimously supported the identification of load requirements for testing variable load turn signal flashers, with one commenter suggesting that this might better be accomplished by referencing SAE J590e. The suggestion was not adopted, as J590e incorporates matter not proposed in Notice 1. The proposal that the maximum voltage drop across flashers be increased from 0.45 volt to 0.8 volt was supported by four vehicle manufacturers with a fifth suggesting an increase to 0.6 volt. It was objected to by six commenters, all of them flasher manufacturers, on the grounds that it would result in a lessening of light output. The NHTSA recognized this possibility in Notice 1, but noted that the diminution would be so slight as to be undetectable by the human eye, while the public would be afforded the choice of a flasher with greater life expectancy. The amendment increasing the minimum voltage drop is adopted as proposed.

In consideration of the foregoing, 49 CFR 571.108 Motor Vehicle Safety Standard No. 108 is amended. . . .

Effective date: May 29, 1974. Because these amendments either relax a requirement or reflect existing widespread industry practice, and create no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on April 24, 1974.

James B. Gregory
Administrator

39 F.R. 15130
May 1, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 73–33; Notice 2)

This notice amends 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to allow variable-load turn signal flashers on trucks that are capable of accommodating slide-in campers.

The proposal on which the amendment is based was published on January 3, 1974 (39 F.R. 822), pursuant to a petition by Ford Motor Company. Standard No. 108 presently requires turn signal failure indication in accordance with SAE Standard J588d, except on vehicles whose overall width is 80 inches or more, and on vehicles equipped to tow trailers. This has the effect of mandating use of fixed-load flashers, since special circuitry would be necessary to sense and indicate a failure in a variable-load system.

The NHTSA proposed to include trucks capable of accommodating slide-in campers in the group of vehicles not required to have a failure indicator (and hence allowed to have variable-load flashers). The problem presented by Ford may be summarized as follows: when camper turn signal lamps are added to the turn signal circuit of the vehicle carrying the camper, the flash rate will increase, to a level generally exceeding the maximum specified by Standard No. 108. Allowing a variable-load flasher will insure a uniform flash rate when the camper is installed.

In response to the opportunity afforded for comments, seven submittals were received. Six supported the proposal. The seventh commenter, a foreign equipment manufacturer, opposed the proposal on the grounds that suitable flashers for similar applications are available in Europe.

The NHTSA has determined that the availability of variable-load flashers ensuring flash rate control within the limits of the standard is desirable, and should be permitted on trucks capable of accommodating slide-in campers, despite the lack of lamp failure indication. In order to make clear the intent of the regulation, language is being added to specify that the exception applies only to vehicles with variable-load flashers.

In consideration of the foregoing, paragraph S4.5.6 of 49 CFR 571. 108, Motor Vehicle Safety Standard No. 108 is revised. . . .

Effective date: June 6, 1974. Because the amendment allows an additional option and creates no additional burden, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on May 31, 1974.

James B. Gregory
Administrator

39 F.R. 20063
June 6, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

(Docket No. 74–16; Notice 2)

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distance values for the various tests would be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars*. As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.

The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unnecessary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown that an effective date earlier than 180 days after issuance of the amendments is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on September 6, 1974.

James B. Gregory
Administrator

39 F.R. 32914
September 12, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

(Docket No. 69–19; Notice 9)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to waive the requirement that there be a 4-inch minimum spacing between a front turn signal and a low-beam headlamp whenever the turn signal lamp's photometric output is at least two and one-half times the minimum required. The amendment is effective October 17, 1974.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking (Docket No. 69–19, Notice 3) published on October 25, 1972 (37 F.R. 22801), and due consideration has been given to the comments received in response to the notice.

In order to enhance detectability of front lamp function by oncoming drivers at a distance, Standard No. 108 through its incorporation of SAE Standard J588d, "Turn Signal Lamps," requires at least 4 inches of spacing between a front turn signal lamp and a low beam headlamp. However, as part of Notice 3, the NHTSA proposed in paragraph S8.12 that turn signal lamps and low beam headlamps could be closer if the candlepower output of the turn signal lamp is at least two and one-half times that specified for yellow turn signal lamps in the SAE standard. Mercedes-Benz of North America has asked the NHTSA to make an early decision on the proposal to facilitate its product development plans.

Comments in general supported the proposal. Some requested removal of the 4-inch limitation regardless of turn signal photometric output. Others felt that the photometric values of all front turn signal lamps should be two and one-half times the present minimum. The NHTSA has decided to amend the standard primarily as proposed, but with reference to the grouped test points of Figure 1 of the standard rather than to the individual test points of J588.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is amended by adding new paragraph S4.3.1.7 . . . .

Effective date: October 17, 1974. Because the amendment relieves a restriction without imposing new requirements on any person, it is found for good cause shown that an effective date earlier than 180 days after the issuance of the amendment is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718, (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on September 12, 1974.

James B. Gregory
Administrator

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, to resolve an unintended ambiguity between paragraphs S4.1.1.11 and S4.1.1.12, and paragraph S4.3.1.1.

Paragraphs S4.1.1.11, S4.1.1.12 and S4.1.1.22 allow photometric conformance of parking lamps, stop lamps, taillamps, turn signal lamps, and backup lamps to be determined by measurement of sums of values within specified groups of test points. Paragraph S4.3.1.1 prohibits vehicle equipment obscuring the photometric output "at any test point" specified in SAE materials unless auxiliary lighting equipment is provided that meets all photometric requirements. Standard No. 108 can thus be interpreted as requiring the addition of auxiliary lighting equipment if, for example, a single test point of a taillamp is obscured by part of the vehicle, even though the taillamp might meet the group requirements of Figure 1. NHTSA is therefore amending paragraph S4.3.1.1 to remove the ambiguity.

In consideration of the foregoing the second sentence of paragraph S4.3.1.1 of 49 CFR 571.108 Motor Vehicle Safety Standard No. 108 is revised.

Effective date: April 21, 1975. Because the amendment clarifies an ambiguity and creates no additional burden on any person, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on April 15, 1975.

James B. Gregory
Administrator

40 F.R. 17574
April 21, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 74–34; Notice 2)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to define in objective terms an acceptable level of surface gloss and/or haze for plastic materials used for lamp lenses following an outdoor exposure test. The amendment is effective upon publication in the *Federal Register*. It is based upon a notice of proposed rulemaking published on September 30, 1974 (39 F.R. 35179).

Paragraph S4.1.2 of Standard No. 108 incorporates by reference SAE Recommended Practice J576b, *Plastic materials for use in optical parts, such as lenses and reflectors, of motor vehicle lighting devices*. This practice requires in pertinent part (Paragraph 4.2.2) that, following an outdoor exposure test of 2 years' duration, exposed samples, when compared with unexposed control samples, shall not show haze or loss of surface luster. This requirement has been interpreted as forbidding any haze or loss of surface luster, and has prohibited the use of plastics of uncoated polycarbonate resin, as these plastics show a surface change after outdoor weathering. General Electric Company petitioned for rulemaking to amend Standard No. 108 to define in objective terms an acceptable level of surface gloss, so that uncoated polycarbonate plastic may be used for exterior automotive applications. Although a protective coating is available for the plastic, GE stated that vehicle manufacturers are reluctant to use it because of the cost involved, "from 3–40 cents per lens depending upon the size."

In support of its petition GE submitted a large body of technical information showing the effect of surface gloss reduction on the photometric performance and signaling effectiveness of various types of lighting devices used on motor vehicles. These tests showed that at the end of a 3-year period the photometric output through uncoated polycarbonate lenses decreases, on the average, less than 10 percent. In GE's view, deglossing to haze levels of 50 percent does not appear significantly to affect the overall photometric performance and signaling effectiveness of a lamp. The effect of haze is to scatter light from the point of maximum intensity to the wider angle test points, resulting in a diminution of light output at the former, and an increase at the latter. In accordance with GE's test data and suggestion, however, the National Highway Traffic Safety Administration (NHTSA) proposed that haze level should not exceed 30 percent. NHTSA tentatively found that the proposed amendments would enhance traffic safety. Polycarbonate lenses appear to offer some benefits lacking in conventional plastics in terms of heat resistance and higher impact strength.

It was also proposed to update the referenced SAE Recommended Practice J576b, to J576c, effective January 1, 1976. This substitution had been previously proposed (Docket No. 69–19; Notice 3, 37 F.R. 22806) and favorably commented upon. The only difference is that J576c requires a 3-year exposure test while J576b requires only a 2-year one.

Comments submitted in response to the notice generally indicated support by vehicle manufacturers, and opposition by manufacturers of lamps and plastic materials. It was argued that the data in the petition did not support a relaxation, and that further data and study were necessary before a decision could be made. These arguments do not appear to have merit. On the basis of the comments, however, the amendment excludes reflex reflectors. The current higher performance level is justified for reflector materials, which do not have a light source shining through them. In addition, the amendment specifies that the tests are performed on lens materials rather than finished lenses.

The economic effect of the amendment is that by allowing use of uncoated polycarbonate materials, a lens possessing superior heat resistance and impact durability will be made available at a lesser cost.

In consideration of the foregoing, 49 CFR 571.108 is amended. . . .

Effective date: June 18, 1975. Since the amendment does not require compliance before January 1, 1976 and allows optional compliance until then, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on June 12, 1975.

James B. Gregory
Administrator

40 F.R. 25677
June 18, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 75–8; Notice 2)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to remove the restriction that would disallow manufacture of vehicles with four-lamp rectangular headlamp systems on and after September 1, 1976.

The NHTSA proposed on April 30, 1975 (40 FR 18795) the termination of the amendment to Standard No. 108 adopted November 30, 1973 (38 FR 33084), that disallowed use of rectangular headlamp systems on motor vehicles manufactured on or after September 1, 1976. In allowing probationary use of the new headlamp system, this agency had concluded that the interests of safety required a period in which the systems could be evaluated as to on-road performance and availability of replacements. A final decision was scheduled for late in 1975 on whether to allow continued use of such systems, and if so, whether to retain the current dimensions or to propose modifications.

The NHTSA has decided to remove the termination date of September 1, 1976, thus allowing indefinite use of four-lamp rectangular headlamp systems, and to retain the current dimensions. In the period that rectangular systems have been in use no service or supply problems have come to this agency's attention. The lamps have been tested and approved by the American Association of Motor Vehicle Administrators. No comments to the notice of April 30, 1975, objected to the removal of the termination date, and all those who commented on the issue supported it. The dimensions specified in Standard No. 108 have been adopted by the Society of Automotive Engineers in SAE Standard J579c, "Sealed Beam Headlamp Units for Motor Vehicles," December 1975, and are now accepted by the motor vehicle and lighting industries. There has been occasional criticism that these systems increase vehicle weight and cost without a corresponding benefit in safety. Any weight increases are very minor, however. The purpose of the amendment was to remove a design restriction and to allow manufacturers and consumers the freedom to choose an alternative but equivalent headlighting system. The cost increase is not, therefore, mandated by the standard.

The Administrator also requested comments in the April 30, 1975, notice as to the advisability of proposing an amendment to Standard No. 108 that would allow a single two-lamp rectangular system. Commenters generally supported the concept of a two-lamp system, advising dimensions based upon SAE recommendations. The subject is now under consideration by the agency.

In consideration of the foregoing, paragraph S4.1.1.21 of 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is amended by deleting the phrase "manufactured between January 1, 1974 and September 1, 1976" and substituting the phrase "manufactured on or after January 1, 1974".

Effective date: November 24, 1975. Because the amendment relieves a restriction and creates no additional burden on any person it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51)

Issued on November 17, 1975.

James B. Greory
Administrator

40 F.R. 54426
November 24, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 75–15; Notice 2)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices and Associated Equipment*, to modify requirements for clearance lamps on vehicles of special configuration.

Notice of the amendment was published on June 5, 1975 (40 FR 24204), and an opportunity afforded for comment. The NHTSA proposed that the inboard visibility angle of 45 degrees for clearance lamps need not be met on a vehicle where it is necessary to mount the lamps on surfaces other than the extreme front or rear to indicate the overall width or for protection from damage during normal operation of the vehicle. Restricted inboard visibility angles of clearance lamps are encountered on many types of vehicles other than boat trailers and horse trailers. Examples are (1) front clearance lamps that are mounted on a truck body behind the cab and below the top of the cab, and (2) front and rear clearance lamps mounted on the fenders of trucks and trailers such as liquid and bulk commodity vehicles and cement mixer carriers.

Eleven comments were submitted by manufacturers, trade associations, and the California Highway Patrol. Ten of these supported the amendment. The sole dissenter felt that there might be traffic situations where visibility at some inboard positions would be important. Trailmobile and Recreational Vehicle Industry Association requested modifications to Standard No. 108 that were beyond the scope of the proposal and thus were not considered.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is amended. . . .

Effective date: November 24, 1975. Because the amendment relieves a restriction and creates no additional burden upon any person, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51)

Issued on November 17, 1975.

James B. Gregory
Administrator

40 F.R. 54427
November 24, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–19; Notice 10)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to clarify the electrical terminal specifications for Type 1A rectangular headlamps.

Standard No. 108 was amended on November 30, 1973, (38 FR 33084) to specify requirements for rectangular headlamps that may be used as an option in a four-headlamp system. Figure 2 of the amended standard specifies certain interchangeability features of Type 1A and 2A rectangular headlamps, including location and arrangement of the electrical terminals. The three terminals shown in Figure 2 are designed as "ground," "lower beam," and "Type 2A upper beam." The terminal designated as "lower beam" is used as the terminal for the upper beam on Type IA headlamps. This is implied by the notation, "no connection or terminal for Type 1A headlamp," under the phrase "Type 2A upper beam," since the ground is not a connection, but the figure may not be sufficiently clear on that point. In order to make it clear, this notice amends Figure 2 so that the "lower beam" terminal is redesignated as the "Type 2A lower beam or Type 1A upper beam" terminal.

It has also come to the attention of this agency that certain dimensional tolerances of Figure 2 are unnecessarily restrictive and that other methods of dimensioning are more applicable in certain cases. In addition, an optional terminal configuration permitted for other headlamps is not currently included for the Type 1A and 2A headlamps.

Accordingly, Figure 2 is being revised to provide a tolerance change to the overall lamp width (6.58 inches) and height (4.20 inches). The lamp corner radius of 0.56 inch is changed to 0.54 inch, a terminal spacing of 0.333 inch is changed to 0.335 inch, and an optional terminal configuration is specified. A dimension is included for the seating lugs, and a different method of dimensioning the locating lug is specified.

These changes do not affect interchangeability or performance of the lamps and are specified only to relieve unnecessary restrictions.

Effective date: December 23, 1975. Because the amendment creates no additional burden upon any person it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51)

Issued on December 3, 1975.

James B. Gregory
Administrator

40 F.R. 59349
December 23, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–19; Notice 11)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, primarily to modify requirements applicable to turn signal lamps. The amendments are effective January 5, 1976.

Triangle Home Products has petitioned for immediate adoption of SAE Standard J588e, *Turn Signal Lamps*, September 1970, as the referenced standard for that item of lighting equipment. This change was originally proposed by NHTSA in Notice 3, Docket No. 69–19 (37 F.R. 22801). SAE J588e differs from J588d in several respects, the principal one being that the minimum effective projected luminous area of all turn signal lamps is 8 square inches. SAE J588d had divided turn signal lamps into two classes, A and B, but this no longer occurs in J588e. Class A turn signal lamps were those with a lens area not less than 12 square inches, while Class B were those whose minimum lens area was not less than 3.5 square inches. The amendment means that the minimum required luminous area of turn signals on passenger cars, and on other vehicles (except motorcycles) less than 80 inches in overall width, is increased to 8 square inches from 3.5 square inches, while that of larger vehicles is reduced to 8 from 12 square inches. The agency expects there to be no effect upon safety from this reduction as the photometric requirements are unchanged.

This proposal was not uniformly supported, several manufacturers objecting that the increase in minimum area from 3.5 square inches to 8 square inches was unnecessary, and suggesting 5 square inches instead. The NHTSA notes, however, that the SAE adopted J588e after many tests that demonstrated that the increase to 8 square inches, by providing more signal area, resulted in better estimation of the position of the signaling vehicle as seen by drivers of oncoming and following vehicles. Because of the increased photometrics for turn signal lamps that became effective January 1, 1970, it is difficult to manufacture lamps smaller than 8 square inches and produce the required light output. Finally, an area smaller than 8 square inches would increase the unit area intensity to a level that is likely to be distressing to many drivers. It is likely, however, in spite of the objections to the proposal that the industry conforms at present. The NHTSA surveyed the turn signal lens of 18 contemporary domestic and foreign passenger cars, finding no lens area less than 8 square inches, with the average at 14. However, the amendments permit continued compliance with J588d, on an optional basis, until September 1, 1978.

Notice 3 also proposed the adoption of updated SAE Standards, J585d and J586c, for tail lamps and stop lamps respectively. There were no objections to these proposals. The principal difference in the updated standards is the inclusion of definitions of and photometering instructions for multiple compartment lamps and multiple lamp arrangements. SAE J586c also establishes a minimum of 8 square inches for the effective projected luminous lens area of stop lamps, and, in a combination stop lamp-turn signal lamp, prohibits operation of the stop lamp while the turn signal is flashing. SAE J585d, in a change from J585c, requires measurement of photometrics not less than 10 feet from the photometer screen, the previous distance being a minimum of 4 feet. Because of these changes, the NHTSA is permitting continued compliance with J585c and J586b until September 1, 1978.

Accordingly, Standard No. 108 is being amended to incorporate the three new SAE Standards. Editorial amendments are also made to S4.1.1.6, S4.1.1.7, S4.1.1.12, S4.5.5 and S5.1 to conform them to the new requirements.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is amended. . . .

Effective date: January 5, 1976. Because the effect of the amendments is to allow compliance with either the new or the existing requirements until September 1, 1978, an immediate effective date imposes no additional burden on any person and is found for good cause shown to be in the public interet.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.50)

Issued on December 23, 1975.

James B. Gregory
Administrator

41 F.R. 765
January 5, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–19; Notice 12)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, to allow conformance with SAE Standard J579c, "Sealed Beam Headlamp Units for Motor Vehicles", December 1974 as an option to compliance with the presently referenced SAE Standard J579a.

On October 25, 1972, the National Highway Traffic Safety Administration proposed (37 FR 22801) as part of a comprehensive rulemaking action that SAE Standard J579a, as currently referenced in Standard No. 108, be replaced by SAE Standard J579b. Except for the increased maximum candlepower (75,000 candlepower) specified in SAE Standard J579b, the commenters generally supported this proposal. SAE Standard J579c has added a definition of H–V axis and a description of rectangular sealed beam headlighting systems; otherwise it is identical to J579b.

SAE Standard J579c provides compatibility between headlight beam positions regardless of whether the headlamp is aimed by mechanical, optical, or visual methods, unlike SAE Standard J579a, which results in different beam positions if the lamp is aimed by mechanical methods instead of optical or visual methods. Since the headlamp beam position provided by the optical and visual aim methods is higher and results in greater seeing distance for the driver, the same improvement should be afforded by mechanical aim methods.

SAE Standard J579c contains minor changes in photometrics at certain test points which also provide improved lighting, but are of such a minor technical nature that allowance of these values would be a relief of a restriction. However, this amendment of Standard No. 108 restricts the maximum candlepower output, for the present time, to 37,500. The question of allowing the SAE maximum of 75,000 candlepower was raised in the notice of October 25, 1972, and will be considered in future rulemaking actions.

In consideration of the foregoing, amendments are made to 49 CFR § 571.108, Motor Vehicle Safety Standard No. 108. . . .

Effective date: January 8, 1976. Because the amendment allows an option, relieves restrictions, and creates no additional burden on any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on January 5, 1976.

James B. Gregory
Administrator

41 F.R. 1483
January 8, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–19; Notice 14)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to provide identical wattage tolerances for headlamps with rectangular and circular lenses.

Standard No. 108 was amended on January 8, 1976 (41 FR 1483), to add S4.1.1.33 which provided, in subparagraph (c), an allowable tolerance of plus 7.5 percent for the maximum design wattage of headlamps with circular lenses that conform to SAE Standard J579c, *Sealed Beam Headlamp Units for Motor Vehicles*, December 1974. The question has been raised by Stanley Electric Co., Ltd., of Tokyo, Japan, and General Motors Corp. of Warren, Michigan, whether the same tolerance applies for the maximum design wattage of headlamps with rectangular lenses.

The answer is yes, and S4.1.1.21(b) is amended by this notice to provide an allowable tolerance of plus 7.5 percent for Type 1A and Type 2A headlamps. The 7.5 percent tolerance is the average actual maximum wattage (as opposed to design wattage) rating of headlamps listed in Table 2 of SAE Standard J573d, *Lamp Bulbs and Sealed Units*, December 1968, as determined by multiplication of the maximum amperage times the design volts, and applies to all Type 1, Type 1A, Type 2 and Type 2A headlamps.

In consideration of the foregoing, subparagraph (b) of S4.1.1.21 is deleted and a new subparagraph (b) is added. . . .

Effective date: June 21, 1976. Because this amendment clarifies an existing requirement and creates no additional burden upon any person, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 14, 1976.

James B. Gregory
Administrator

41 F.R. 24886
June 21, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 75–8; Notice 5)

This notice amends 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to allow use of a two-lamp rectangular headlamp system on motor vehicles manufactured on or after November 1, 1976.

On April 15, 1976, the agency proposed (41 FR 15870) that a system of two headlamps conforming to SAE Recommended Practice J1132—"142mm × 200mm Sealed Beam Headlamp Unit," January 1976, be used as an option in a two-headlamp system, and that applicable referenced and subreferenced SAE Standards and Recommended Practices not specifically included in SAE J1132 be those published in the 1976 SAE Handbook. A corrective notice was published on May 6, 1976 (41 FR 18687) clarifying that the headlamps would be "designed to conform" with J1132, consistent with other requirements for compliance of lighting equipment. The comments have received full consideration in adoption of this amendment.

The proposal was generally supported by vehicle and lighting manufacturers. Commenters indicated approval of the relief of a design restriction and the allowance of a greater choice of headlamps. Those who opposed the proposal commented that it might be difficult to obtain a replacement headlamp and that the 2-lamp rectangular system would complicate the supply-distribution network. Others commented that new mechanical aimers would be required for the two-lamp system.

In response to these comments, a study of the introductory period of the 4-lamp rectangular system demonstrated that replacement lamps were generally available, the supply-distribution network functioned as well as with older conventional headlamps, and that rectangular lamps could be inspected and properly aimed as well as, if not better, than those with circular lenses. Although the 4-lamp system required development of a new mechanical aimer, the 2-lamp system will require only a simple adapter for the aimer.

Lamp manufacturers commented that the rectangular lamps may have more service performance difficulties than the circular types. However, unlike the 4-lamp system, the 2-lamp Type 2B system provides improved aim, about 15 percent higher photometrics in low beam performance, and up to 100 percent improvement in high beam performance.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200) the agency has evaluated the economic and other consequences of this action on the public and private sector, including possible loss of safety benefits. Since the system itself is an optional one, in one sense there is neither an adverse or positive economic impact. A Type 2B headlamp is expected to cost 150 percent of a conventional Type 2 headlamp but because of the improved photometrics of the lamp, the amendment should result in an overall benefit to safety.

The National Motor Vehicle Safety Advisory Council has not taken a position on the amendment.

In consideration of the foregoing a new paragraph S4.1.1.34 is added to 49 CFR 571.108, Motor Vehicle Safety Standard No. 108. . . .

Effective date: November 1, 1976. Because the amendment relieves a restriction and allows an optional means of compliance, it creates no additional burden upon any person. Accordingly, it is found for good cause shown that an effective date earlier than 180 days after publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on October 13, 1976.

John W. Snow
Administrator

41 F.R. 46437
October 21, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69–19; Notice 16)

This notice amends 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, in minor respects.

This agency recently reviewed Motor Vehicle Safety Standard No. 108 and discovered five minor errors which this notice corrects. The first is an amendment of S4.1.1.4 to substitute SAE Standard J594e, "Reflex Reflectors," March 1970 as the referenced SAE Standard, a change inadvertently omitted when Table I and Table III were amended to incorporate J594e (37 FR 15514, August 3, 1972). The second corrects typographical errors in S4.1.1.17 that occurred in the republication of the standard on August 23, 1976 (41 FR 35522). The third is a correction of S4.3.1 which currently excludes "S4.3.1.8" from its applicability. There is no S4.3.1.8. The fourth amendment corrects a typographical error in S4.3.1.1.1 that also occurred in the republication of the standard. The final amendment substitutes "J593c, February 1968" in Table III as the referenced standard for backup lamps, in place of "J593e, July 1972". This error initially occurred in "Volume 49 CFR Parts 200 to 999 revised as of October 1, 1975."

In consideration of the foregoing 49 CFR 571.108, Motor Vehicle Safety Standard No. 108 is amended as follows.

Effective date: November 1, 1976. Since the amendments are corrective in nature and impose no additional burden upon any person, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 12, 1976.

John W. Snow
Administrator

41 F.R. 50826
November 18, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 71–19; Notice 06)
(Docket No. 75–32; Notice 02)

This notice responds to petitions for reconsideration of the newly established Standard No. *120*, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*, by amendments to the standard in the areas of tire and rim selection, rim marking, and tire label information. A minor amendment of Part 567, Certification," is also made. In addition, the decision that the agency no longer regulates mobile structure trailers (mobile homes) is also set forth, along with appropriate conforming amendments of Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and § 71.3, *Definitions*, of Part 571.

Standard No. 120 (49 CFR 571.120) establishes that multipurpose passenger vehicles (MPV's), trucks, buses, motorcycles, and trailers shall be equipped with tires and rims that are adequate to support the fully-loaded vehicle under contemplated operating conditions. The legislative history of the National Traffic and Motor Vehicle Safety Act (the Act) (15 U.S.C. 1381, *et seq.*) and § 202 of that Act establish Congress' concern that motor vehicles could be equipped with inadequate tires and that regulation would be necessary to protect against this problem:

> Sec. 202. In standards established under title I of this Act the Secretary shall require that each motor vehicle be equipped by the manufacturer or by the purchaser thereof at the time of the first purchase thereof in good faith for purposes other than resale with tires which meet the maximum permissible load standards when such vehicle is fully loaded with the maximum number of passengers it is designed to carry and a reasonable amount of luggage.

Standard No. 120 was promulgated January 19, 1976 (41 FR 3478, January 26, 1976), and 17 petitions for reconsideration of particular provisions were filed by vehicle, tire, and rim manufacturers, and by trade associations representing these manufacturers. In view of the length of time that has been taken to respond to these petitions for reconsideration, the effective dates for implementation of several of the standard's provisions were delayed (41 FR 18659, May 6, 1976) (41 FR 36657, August 31, 1976). The standard's basic provision for tire and rim selection (S5.1) was not delayed and became effective September 1, 1976.

Tire and rim selection. The primary effect of Standard No. 120 is fulfillment of § 202 of the Act by specification of the minimum load-carrying characteristics of tires on motor vehicles not already subject to the passenger care tire and rim selection requirements of Standard No. 110, *Tire Selection and Rims*, of Part 571. The rim selection requirements of the standard are limited (use of a rim designated as suitable by the tire manufacturer for use with its product; use of "DOT" labeled rims on and after September 1, 1979) in anticipation of more comprehensive regulation of rims as part of an upcoming wheel standard.

Tire selection consist of two elements: With one exception, each vehicle must be equipped with tires that comply with Standard No. 119, *New Pneumatice Tires for Vehicles Other than Passenger Cars* (or Standard No. 109, *New Pneumatic Tires*), and the load rating of the tires on each axle of the vehicle must together at least equal the gross axle weight rating (GAWR) for that axle. The term GAWR is defined in § 571.3 of Part 571 as ". . . the value specified by the vehicle manufacturer as the load-carrying capacity of single axle system, as measured at the tire-ground interfaces." The GAWR concept formalizes the decision each manfacturer makes about the load-bearing ability of the tires, rims,- axle, brakes, and suspension components (at a minimum) chosen to support and control the loaded vehicle.

The Truck Equipment Body Distributors Association (TEBDA) questioned the requirement that, with one exception, each vehicle subject to Standard No. 120 be equipped with tires that conform to Standard No. 119 (or Standard No. 109). TEBDA's March 17, 1976, letter concerned certification of trucks equipped for agricultural service with Goodyear "Terra-Tires." The "Terra-Tire" is one example of tires that are placed on specialized motor vehicles which operate both on and off the highway. The tires are specially designed and are unable to be certified to either of the tire performance standards.

Section S5.1.1 specifies that "each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirement of [the tire] standard[s] . . . ." This language is intended to exclude from the requirement for Standard 119 (or 109) tires those vehicles which the manufacturer (or person later in the chain of distribution) decides to equip with tires other than "tires for highway service." The decision is left with the manufacturer at this time in view of the absence of data that demonstrates problems in the use of these tires that would justify their elimination. Any pattern of accident occurrence that points to unsafe utilization of non-highway service tires would presumably constitute a safety-related defect and could lead to revision of Standard No. 120 to regulate them. At this time, the answer to TEBDA is that the tire selection requirements of S5.1.1. ,and S5.1.2 as a logical extension of S5.1.1) would not apply to a vehicle equipped with non-highway service tires. It is emphasized that this exclusion from Standard No. 120 bears no direct relationship to the determination of whether a particular vehicle qualifies as a "motor vehicle" as that term is defined in § 102(3) of the Act.

The second requirement for tire selection (S5.1.2) is that "[t]he sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system. . . ." Comparable further specification exists when multiple ratings appear on the certification label, or the tires used on the vehicle are not listed on the certification label.

Because no petition directly raised objections to the requirements of S5.1.2, the agency first addresses issues raised in a separate and outstanding NHTSA proposal dealing with tire choice and its relationship to GAWR. The action (Definition of "Gross Axle Weight Rating," 40 FR 58152, December 15, 1975) proposed that the GAWR determination be based on, among other things, the vehicle's maximum attainable speed or the maximum load rating of the tire established by the tire manufacturer at 60 mph, whichever is lower. The proposed modification was intended to reflect the industry practice of assigning (in most cases) and labeling (in accordance with Standards 119 and 109) a tire's basic load-carrying capabilities in recognition of the unrestricted highway speeds to which it is normally exposed. This formalization of GAWR determination was intended to prevent manufacturers from assigning higher capabilities to tires than their 60-mph ratings, based on arbitrarily low speeds.

Most comments supported the GAWR proposal, although several truck manufacturers asked that the term "maximum attainable speed" be specifically defined as it is elsewhere in NHTSA regulations. Ford Motor Company opposed the proposed change in the definition of GAWR as an arbitrary selection of only one of the many criteria that enter into the determination of GAWR. The company suggested that other means exist to prevent assignment of arbitrary GAWR's based on tire ratings other than those established at 60 mph and so labeled on the tire sidewall.

The NHTSA agrees with Ford and notes that the "other means" to regulate this practice exist in the tire selection requirements of S5.1.2 of Standard No. 120. At the time of the GAWR proposal, Standard 120 had not been made final. Since its implementation on September 1, 1976, a manufacturer is free to determine GAWR as in the past, but the maximum load ratings (marked on the tire sidewall) of tires on the vehicle must at least equal the GAWR listed. For this reason, the NHTSA's proposal for amendment of the GAWR definition is considered unnecessary and is therefore withdrawn. Further notice and opportunity for comment will precede any further action on the proposal set forth in that notice.

Several issues were raised in regard to the GAWR proposal that should be addressed for purposes of clarification. The Heavy & Specialized Carriers Conference of the American Trucking Associations (HSCC) cautioned the NHTSA against requiring an "unrestricted speed GAWR" on the Part 567 certification label in view of two State laws (or regulations) that no vehicle can operate on the state highways at gross vehicle weights greater than those listed on the vehicle in accordance with Federal regulations. It is common practice to load some "heavy hauler" vehicles to a gross vehicle weight that exceeds the unrestricted speed ratings of the vehicle tires, because the vehicle's tires are capable of carrying greater weight at reduced speeds.

As issued, Standard No. 120 required that the maximum load ratings of the tires at least equal the GAWR. This effectively limits the GVWR to the sum of these GAWR's (except in the case of semi-trailers). In the agency's view, however, the problem cited by HSCC can be avoided by listing additional GAWR's (calculated for reduced speed operation) at the end of the certification plate following the required data on the label. This practice has been followed by members of the Truck Trailer Manufacturers Association (TTMA) and was confirmed as permissible by the NHTSA in a March 5, 1975, letter to the TTMA. In order to aid resolution of issues that may arise between States that wish to refer to the certification label and operators that wish to continue the additional rating system, the agency hereby makes an interpretive amendment to Part 567 to specify where additional ratings may appear.

Based on this understanding of the relationship between choice of tires under S5.1.2 of Standard No. 120 and the determination of GAWR under § 567.4 of Part 567, a modification of the requirements of Standard No. 120 is justified. In the case of a vehicle that is incapable of the 60-mph speed used by tire manufacturers to establish the maximum load rating that is stamped on the tire sidewall (typically a powered vehicle and not a trailer), it would not be reasonable to require the GAWR's to be strictly limited to the sum of the maximum load ratings of the tires on the vehicle. This is because the vehicle will never achieve the speeds for which maximum load ratings were established. In many cases, provision is made to rate tires for a greater load at the lower (but maximum) speed of which a vehicle is capable. In recognition of this extremely limited specialized situation, the agency amends S5.1.2 to permit installation of tires with reduced speed capabilities in the case of vehicles whose maximum attainable speed is not greater than 50 mph. This amendment is considered to be a technical adjustment of language to fully implement the intent of the final rule as that was established. A separate amendment of § 571.3 is made to establish the basis for determination of a vehicle's maximum attainable speeds.

Volkswagen raised a separate issue concerning the requirement that the sum of maximum load ratings at least equal the GAWR of the axle system. This provision, in the case of an MPV, truck, bus, or trailer that is equipped with passenger car tires, requires that the maximum load ratings on the tires be reduced by approximately 10 percent before calculating the sum. The purpose of this 10-percent reduction in tire rating is to account for the generally harsher treatment (impulse and surge loading in the case of MPV's off-road) to which the tires of a vehicle other than a passenger car are exposed that is not accounted for in passenger car tire ratings. Volkswagen requested data showing that MPV's actually experience more abusive treatment in use.

The MPV category is based in part on the existence of characteristics that make these vehicles less amenable to passenger car standards. If Volkswagen has data indicating that the two categories actually experience identical usage, the

NHTSA would prefer to adjust the definition to ensure that these vehicles are subject to all passenger car standards. Until that time, the existing rationale for excusing these vehicles from some passenger car standards dictates the use of higher strength tires.

As earlier noted, the rim selection requirements of Standard No. 120 are not substantial, consisting of a requirement that the rims be listed by the tire manufacturer as suitable for use with its tires, and a requirement that, on and after September 1, 1979, the rims used on a vehicle be labeled as specified in S5.2 of the standard. The September 1, 1979, date for use of labeled rims replaced a March 1, 1977, date that proved impractical in view of large inventories of unlabeled rims that exist and will exist long after rim labeling is begun. In establishing the later effective date, the agency noted that it was considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available. Experience with phase-in of newly regulated equipment in other areas such as tires and brake hoses has demonstrated that the requirement for labeled equipment on and after a particular date can create substantial inventory and potential economic waste problems. In view of experience that the delay of labeling requirements has not substantially impeded certification verification and defect actions, the NHTSA has decided to withdraw the requirement (that appears as the last sentence of S5.1.1). It is noted that withdrawal of this requirement does not affect the requirement of S5.1.2 that rims be listed as suitable by the tire manufacturer for use with the tires that equip the vehicle, or the requirement of S5.2 that rims be labeled with specified information.

Mobile structure trailers. With regard to the applicability of this standard and other standards as a general matter, the NHTSA takes this opportunity to publish in the *Federal Register* its conclusion that enactment of the National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the Mobile Home Act) impliedly repealed this agency's authority to regulate mobile homes. This conclusion was announced in a May 5, 1976, letter to the Department of Housing and Urban Development that stated in relevant part:

> The National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the "Mobile Home Act") established within the Department of Housing and Urban Development a comprehensive program for the regulation of mobile homes. We have concluded that one result of that statute's enactment was the implied repeal of the NHTSA's authority with respect to mobile homes. Accordingly, we consider that the enactment has the effect of amending the Vehicle Safety Act's definition of "motor vehicle" to exclude "mobile homes" as the latter term is defined in the Mobile Home Act.

The effect of this conclusion is that tire and rim selection for mobile homes (known as "mobile structure trailers" by the NHTSA) is no longer subject to Standard No. 120 or other regulations issued under authority of the Act. For this reason, references to "mobile structure trailer" in Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and the general definitions section of Part 571 (§ 571.3) are deleted.

On the same subject, a May 25, 1976 (and supplementing July 7, 1976), letter from Firestone to the NHTSA asked whether tires manufactured exclusively for mobile homes and tires that are used on mobile homes (although manufactured for other uses) are subject to regulation under the Act. Similar questions were raised as to the status of rims, some of which are designed exclusively for use on mobile homes and some of which are used on mobile homes and other vehicles.

As for tires, Standard No. 109 applied to "tires for use on passenger cars" and Standard No. 119 applies to "tires designed for highway use on [specified motor vehicles]." By these terms, neither standard applies to tires designed exclusively for use on mobile homes. In the case of tires actually used on mobile homes but designed for use also on vehicles subject to the Act, the agency considers such tires to be subject to the standard's requirements because they constitute motor vehicle equipment as that term is defined in § 102(4) of the Act.

As for rims, Standard No. 110 contains specifications only for rims that equip passenger cars and therefore contains no requirements that would directly require performance of a rim that was installed on a mobile home. Standard No. 120 applies to rims "for use on" MPV's, trucks, buses, motorcycles, and trailers (other than mobile structure trailers) and therefore would not apply to rims designed exclusively for use on mobile homes. In the case of rims designed for use on any of the motor vehicle types listed, the NHTSA would consider Standard No. 120's requirements applicable, and labeling in accordance with S5.2 would be required.

Rim marking. The second requirement of Standard No. 120 is an equipment requirement specifying five items of information (six in the case of multipiece wheels) that must appear on any rim for use on MPV's, trucks, buses, trailers, or motorcycles. The requirements for location of the information varies according to the type of information and whether the rim is part of a single or multipiece wheel. In answer to a question raised by Kelsey-Hayes and Motor Wheel, it is confirmed that these marking requirements have no bearing on the use of the rim on passenger cars, except as future labeling requirements in Standard No. 110 might prohibit one or more of the items required by S5.2. This eventually is considered to be extremely unlikely.

Based on a comphensive review of the petitions for reconsideration, the agency has decided that some requested modifications in labeling requirements are justified. The Japanese Automobile Manufacturers Association and Suzuki asked that required labeling be permitted to be embossed as well as impressed on the rim. Volkswagen (and representatives from Motor Wheel and Goodyear in a February 4, 1976, meeting with the NHTSA) asked that rim labeling be permitted on the disc portion of a single-piece wheel. The agency considers these suggestions to constitute justifiable options that would not diminish the level of motor vehicle safety represented by the standard, and the standard is accordingly amended.

Motor Wheel requested amendment of the standard to state that labeling of multipiece rims is permitted in the bolt hole area. The agency does not consider the addition of advisory information to be a desirable drafting practice because the mention of bolt hole locations would imply that some restriction on location exists when in fact it does not. In answer to another question from Motor Wheel, more than one "rim type designation" on rim components of a multipiece wheel is permitted by the standard.

Motor Wheel and Goodyear also asked if numbers that contain decimals or "trailing zeros" (*e.g.*, 7.50) could be shortened by deleting the decimal and "trailing zero." The agency believes that abbreviation by dropping the zero will not be confusing and amends the standard to include an example of such abbreviation. Confusion would result from dropping the decimal.

In response to a request by Motor Wheel and Budd Company for a specific provision in S5.1.2 that the marking requirements only apply to newly manufactured wheels, the agency notes the general applicability statement in § 571.7, governing the applicability of all standards found in Part 571, states that ". . . each standard set forth in subpart B of this part applies according to its terms to all motor vehicles or items of motor vehicle equipment the manufacture of which is complete on or after the effective date of the standard." Thus, the standard only applies to rims manufactured on or after the effective date of S5.2.

Manufacturers asked for several revisions of the marking requirements which the agency has considered and concludes are unjustified. This discussion treats the requests in the order that the markings in question appear in S5.2.

With regard to the requirement for marking with a designation that indicates the source of the rim's published dimensions (S5.2(a)), Daido Corporation asked whether the Japanese Industrial Standards' symbol (a stylized combination of the letters J, I, and S) or the letters "JIS" would meet the requirements of S5.2(a)(3) for use of letter "J." The agency interprets its labeling requirements as strictly as any other portion of its requirements and concludes that neither "JIS" nor the JIS symbol would conform to the requirement of S5.2(a)(3). In response to a similar request by Volkswagen to permit "DIN" in place of "D," the agency has considered the idea of permitting the manufacturer the option of a choice of designations, and concludes they are undesirable in the interest of maintaining uniformity and comprehension.

Grove Manufacturing suggested that the single letter designations of "D" and "E" could be mistaken for the load ranges that appear on tires and on the certification label. The agency concludes that the designations on the rim are sufficiently separated to preclude confusion and therefore the recommendation by Grove is not undertaken.

The "rim size designation" required by S5.2(b) is defined in S4 to mean the rim diameter and width. Daido and Volkswagen asked that a width designation followed by a diameter designation be considered as satisfying the requirement for designation of diameter and width. The agency specified the existing order to distinguish rim designations from tire designations. This order of information is being considered as the uniform practice to be adopted by the International Standards Organization. For reasons of uniformity, the requests are denied.

Volkswagen asked that the "DIN" symbol be permitted to signify compliance of the rim with Standard No. 120 in place of the "DOT" symbol required by S5.2(c) for this purpose. The agency does not find that the requirement of § 114 of the Act for certification is satisfied by use of a designation that has a wholly different meaning. Volkswagen's request is therefore denied.

Certification label. The third requirement of Standard No. 120 is that information about suitable tires and rims for use on the vehicle, along with appropriate inflation pressure and speed restriction information, be placed on a label on the vehicle (S5.3). As amended April 29, 1976 (41 FR 18659, May 6, 1976), the standard requires that the information appear on the certification labels of vehicles manufactured on or after September 1, 1977.

Some manufacturers and the Truck Trailer Manufacturers Association (TTMA) objected to the provision of this information on grounds that valid information already appears on the tires and rims that equip the vehicle, and that the information could mislead a person to think that only the listed tires and rims could be used on the vehicle. With regard to the first objection, the NHTSA disagrees and notes that an improper choice of tires or rims (as could occur by replacing original equipment with "custom" rims or the equivalent in tires) could permanently mislead vehicle owners as to the suitable selection of tires and rims. As for the possibility of misleading, the agency believes that a heading over the tire-rim listings (specifically, "SUITABLE TIRE-RIM CHOICE") can be added to the requirements for optional use by a manufacturer who believes the information would be otherwise misleading. With regard to General Motors' note that an owner should be guided by all available information on tire choice (e.g., information in the owner's manual), the agency notes its longstanding position that manufacturers may add statements referring the reader to other publications for additional information.

It is apparent from the examples cited by manufacturers that the decision to place all required data on the certification label could prove cumbersome in some cases, particularly those involving a heavy truck with several available axle combinations. In view of these problems, the agency has decided to remove the restriction on location and permit the information to appear on the certification label or on a separate label that conforms to the requirements for certification labels. The NHTSA notes that this option to provide information on a separate label responds to concern of the Truck Body and Equipment Association (TBEA) for the responsibilities of its final-stage manufacturing membership. The agency does not believe the tire and rim information would be as useful in a location entirely separate from the certification label, and it therefore declines to adopt General Motors' suggestion to use the Vehicle Identification label.

Motorcycle manufacturers and General Motors pointed out that the requirements for listing tire and rim information after GVWR in the case of vehicles, such as motorcycles, that only utilize one GVWR listing, is redundant and therefore wasteful of space. Other manufacturers suggested that the tire-rim information was redundant in the case of multiple GVWR listings, although this is not the case because of the need to associate the appropriate GVWR with GAWR's that may exceed the GVWR. In any event, these comments suggest that GVWR and GAWR could be better linked by revision of the example format to reduce the amount of information that must be listed. The solution is to permit listing of the GVWR alone, followed immediately by corresponding GAWR's and appropriate tire-rim information. The clearer format would be used for single and multiple listings. This revision is described in the new example that accompanies the rule changes at the end of this notice. In conformity with this simplification, the rule is also amended to delete the requirements for GVWR tire-rim-inflation-listings. Depending on manufacturers' reactions to the simplified format, a similar change could be undertaken for the passenger car example found in Part 567 (§ 567.4(h)(1)).

With regard to the items of information that must be listed in accordance with S5.3, General Motors and the TTMA argued that "tires . . . appropriate *as a minimum* for the GAWR" [emphasis added] could be construed to require tires with load rating less than those that the manufacturer would choose to recommend. To eliminate any ambiguity, the agency replaces "at a minimum" with "as specified by S5.1.2".

Suzuki asked whether "cold inflation pressure" means the maximum inflation pressure specified by the tire manufacturer. The TTMA also asked for clarification on this point. The answer is that the requirement does not call for maximum pressure, but the pressure specified by the tire manufacturer as sufficient to carry the load specified by the vehicle manufacturer as the tire's share of the assigned GAWR.

Michelin Tire Corporation noted that listing inflation pressure could be misleading in the case of tire designations that call for different inflation pressures depending on the tire construction. It is the agency's view that any possibility of confusion can easily be avoided by an indication that the tire designation represents a radial tire, so that a person substituting a non-radial tire size with the same designation is aware that the two tires are not identical.

The TBEA requested clarification of the term "maximum speed" as it appeared in the example that accompanied the final rule. The TBEA appeared to misunderstand the example as a reference to the speed capabilities of the vehicle instead of speed restriction of the tires. The agency has in mind only the rare tire types constructed for transit buses and mining and logging operations and so designated. Goodyear and the TTMA appeared to have the same mistaken impression of the requirement.

Speed-restricted vehicles have now been addressed under S5.1.2. In view of the confusion that arose over the requirement, and the agency's assumption that the users of these tires are knowledgeable in the use of the tires, it has been decided to drop the requirement of S5.3(d) altogether.

The TTMA raised several other questions with regard to the information that appears along with the GAWR. In answer to these questions, the effective dates of the standard are such that the manufacturer will be required to list the information specified by S5.3 on and after September 1, 1977. Also, it is not permissible to "bracket" the GVWR and GAWR values for a particular vehicle by specifying the minimum and maximum values that any tire-rim choice could provide. Section 567.4 of Part 567 requires that the GVWR and GAWR's representing the manufacturer determination of the particular vehicles's characteristics must be listed.

The standard does not require the information specified in S5.3 to be listed alongside the additional GVWR's and GAWR's that a manufacturer might list at the end of its certification label as reduced speed ratings. Lastly, the agency does not agree that the GAWR ratings for a semi-trailer are not related to the trailer's GVWR. While the trailer's axles do not support the entire weight of the vehicle, it is still the case that the various GVWR's that could be assigned to a semi-trailer are affected by the GAWR values that can be assigned, and that the GVWR probably differs depending on the GAWR value assigned. In this sense the GAWR's assigned to a semi-trailer's axles do "correspond" to its GVWR.

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The new options, simplification, and reduction of marking and labeling requirements should make compliance with the standard less costly, while the changes are not expected to significantly reduce the level of motor vehicle safety. The exception for speed-restricted vehicles provided in S5.1.2 represents a correction of the requirements to reflect the agency's intent not to prevent the assignment of greater load-carrying capabilities to vehicles at lower speeds. Permitting this practice to continue will result in the avoidance of new costs in the economy.

In consideration of the postponement of effective dates already granted for rim marking and the tire information labeling, the agency concludes that the present effective date schedule permits adequate time for compliance.

In view of the three notices that have modified the text of Standard No. 120, the entire standard (incorporating the amendments made by this notice) is published for the convenience of persons affected.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended . . . .

Effective date: Changes to the text of the Federal Register may be made immediately. The provisions of Standard No. 120 are in effect at this time, except as otherwise provided in the standard.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on January 28, 1977.

John W. Snow
Administrator

42 F.R. 7140
February 7, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Motor Vehicle Lighting

(Docket No. 77–5; Notice 2)

This notice was preceded by a notice of proposed rulemaking issued pursuant to a petition for rulemaking. It amends color specifications for motor vehicle signaling devices. This change is adopted to facilitate manufacturer conformance with OSHA requirements. The change slightly modifies the acceptable color coordinates for yellow (amber).

Effective date: January 1, 1979, with optional compliance permitted as of the date of publication of this amendment in the Federal Register.

For further information contact:

Bill Eason, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–2720).

Supplementary information: On October 25, 1976, the General Electric Company (GE) petitioned for an initiation of rulemaking to amend Federal Motor Vehicle Safety Standard No. 108 to substitute SAE Standard J578b, "Color Specification for Electric Signal Lighting Devices," September 1974, as the color standard for motor vehicle lighting equipment. GE has been confronted with an OSHA proposal to lower the maximum permissible level of arsenic used in glass making, and on that basis intended to eliminate arsenic entirely from its production. Clear glass made with a substitute for arsenic apparently absorbs yellow dye in a manner that differs from glass made with arsenic, with the result that yellow light emitted through it no longer conforms to the color coordinates for yellow (amber) of SAE J578a, but would be within those for J578b. The NHTSA deferred immediate action because of the imminence of SAE J578c which contains color coordinates that are internationally accepted. On February 10, 1977, GE modified its petition, asking only for a definition of the color yellow (amber) identical to that specified in J578c.

Notice of the proposal was published on June 30, 1977, and an opportunity afforded for comment (942 F.R. 33354). Seven comments were received on the proposal, all of which concurred with it. The amendment is therefore adopted.

In consideration of the foregoing paragraph S4.1.5 of 49 CFR 571.108, Motor Vehcile Safety Standard No. 108 is amended. . . .

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1302, 1407); delegation of authority at 49 CFR 1.50)

Issued on June 8, 1978.

Joan Claybrook
Administrator

43 F.R. 25822–25823
June 15, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Motor Vehicle Lighting

(Docket No. 78–5; Notice 3)

Action: Final rule.

Summary: This notice establishes an alternate performance standard for most motor vehicle headlamps which would allow candlepower output on the upper beam to be double the amount currently permitted. It also establishes a marking code for identification and certification of the new headlamps. It also requires that headlamps be adjustable without the necessity of removing trim rings or other ornamental parts. The amendment is issued under the National Traffic and Motor Vehicle Safety Act which requires the issuance of appropriate safety standards. This standard will allow the production of headlamps, both as original and aftermarket equipment, that provide the driver with an increase in seeing distance, and that are marked to insurse compatibility of replacement.

Effective dates: The photometric portion of the amendment is effective upon publication in the Federal Register. Lens marking and certification requirements are effective July 1, 1979. The headlamp adjustability requirement is effective October 1, 1979.

For further information contact:

Bill Eason, Office of Rulemaking, National Highway Traffic Safety Administration, Washington, D.C., 202–426–2720.

Supplementary information: On February 23, 1978, the NHTSA published in 43 FR 7451 a notice of proposal rulemaking (NPRM) that would reduce accidents on the Nation's streets and highways by allowing the production of motor vehicle headlamps with greater light output. The proposal was issued in response to petitions for rulemaking submitted by GTE, Sylvania, General Motors Corp., Koito Manufacturing Co. Ltd. and General Electric Co.

Federal Motor Vehicle Safety Standard No. 108 (49 CFR 571.108), *Lamps, Reflective Devices and Associated Equipment*, requires motor vehicles other than motorcycles to be equipped with a headlighting system that meets, among other specifications, minimum and maximum photometric output values specified by the Society of Automotive Engineers in SAE Standard J579a, Sealed Beam Headlamp Units for Motor Vehicles, August 1965. Under this standard, the maximum candlepower (cp) of headlamps in operation on motor vehicles shall not exceed 75,000. The SAE revised its standard in December 1974 (J579c), one effect of which was to raise the system total output ceiling to 150,000 cp. Shortly thereafter NHTSA added paragraph S4.1.1.33 to Standard No. 108 to allow manufacturers to comply with J579c if they wished, provided that the ceiling imposed by J579a was not exceeded. NHTSA's amendment also imposed maximum design wattage limitations at 12.8 volts. These standards apply to traditional headlamp systems with circular lenses and to a newer system consisting of four lamps with rectangular lenses. When SAE adopted Recommended Practice J1132 "142 mm x 200mm Sealed Beam Headlamp Unit", in January 1976, establishing specifications for a two-lamp rectangular headlamp system, NHTSA added S4.1.1.34, effetive November 1, 1976, allowing this system, without imposing additional candlepower output restrictions. The reason for this regulatory anomaly with NHTSA's intent to raise the candlepower ceiling on the three other headlighting systems within the near furture (now accomplished by this amendment) and the desire not to impose a limitation on manufacturers of the newest system which would be in effect for only a relatively short time. NHTSA research has demonstrated that an increase in photometrics to a maximum of 150,000 cp will enhance seeing ability without any significant increase in glare from properly aimed headlights, but that photometric output exceeding 150,000 cp results in only a marginal increase in visibility with an increase in glare.

In addition, NHTSA proposed establishment of a marking code to be embedded in the lens of each headlamp designed to comply with SAE J579c to enable the agency to determine with ease which version of Standard No. 108 applies to the headlamp, as well as enabling a consumer to replace original equipment headlamps with lamps of compatible photometric output. A marking system identifying headlamps as type "1A", etc. currently exists. The new proposed code consists of three characters. The first is a number indicating the number of beams produced by the lamp, i.e., 1 or 2. The second character is a letter indicating whether the headlamp is a large or small rectangular or circular headlamp. The final character indicates the version, or requirement, of Standard No. 108 which apply to the lamp. For the present this will be "1", until requirements change to the extent that a new identification number is required, as it is anticipated that future headlighting systems may have different wattages, beam patterns and other characteristics and could not serve as replacements for J579c headlamps.

The agency proposed that types 1A, 2A, and 2B would retain their present nomenclature (plus the final digit), while 5¾ inch diameter (146 mm diameter) headlamps will be identified by the letter "C", and 7 inch diameter lamps (178 mm diameter) with the letter "D". Thus, a Type 2D1 headlamp would be the new identification for a Type 2 (7 inch) headlamp permitted a maximum candlepower output of 75,000. Also on the lens, at a location of the manufacturer's choosing, would be the letters "DOT" certifying compliance with requirements of Standard No. 108. Manufacturers wishing to manufacture high intensity lamps will probably change lens molds anyway to provide other marking and to secure improved beam pattern control.

Other proposed changes include substituting SAE J571d for J571c and J580b for J580a as two of the referenced standards on headlamps. SAE J571d incorporates Figure 2 of present Standard No. 108 which would be deleted from the body of the standard under the proposal. SAE J580b differd from J580a primarily by the addition of a definition for "aiming screws", changes of the aiming adjustment test procedure, and the requirement of aim retention with specified applied forces.

More than 380 comments on the proposal were received from manufacturers, State motor vehicles officials, and motorists. All comments have been considered. NHTSA has separated the comments into six major areas which will be discussed separately.

I. The Need for High Intensity Headlamps

The major issue which concerned the commenters was whether there is a need for headlighting systems capable of producing 150,000 candlepower, whether the sealed beam headlamp is the lamp best suited to provide high intensity lighting, and whether this high intensity lighting tends to produce an unacceptabily high level of glare.

Motorists who commented to Docket No. 78–5 appear divided on the question of high intensity headlamps. There are those whose driving is largely urban in nature who argue that their present headlamps are adequate for their motoring needs. There are others in rural areas, who appear to use the upper beam more frequently than the average driver, and who want a brighter headlighting system for their vehicles. This division of opinion confirmed NHTSA's belief that allowance of higher intensity headlamps should be made on an optional basis and that the manufacture of present design headlamps should continue.

Statistics indicate that there is a significantly greater number of deaths and injuries that occur at night, and that cannot be totally attributed to alcohol or fatigue. A disproportionate number of these occur in rural areas where use of the upper beam is more likely to be required due to lack of ambient roadway light, and to occur in the absence of other vehicular traffic. While it is not possible to determine how many of those casualties could have been prevented by better lighting, it is likely that the rate would have been reduced if the vehicles had been equipped with high intensity headlamps; NHTSA's research data indicates that the average night seeing distance for speeds of 50 mph and higher is less than the average braking distance and reaction time at that speed. NHTSA's review shows that a headlighting system using 150,000 candlepower increases nighttime seeing distance by over 20 percent where there are no cars approaching. In addition, research indicates that a sizeable number of pedestrian accidents occurring in rural and suburban areas could be reduced by improvements in roadway lighting; it is likely that better headlamps could provide some of these improvements.

Several commenters who are proponents of European unsealed lighting systems questioned whether the sealed beam system is the best medium for a high intensity headlamp, and suggested it would create an unacceptably high level of glare. All of NHTSA's extensive research on vehicle lighting has considered both disability glare, measured in possible loss of seeing distance, and discomfort glare, assessed by test subjects who were scientifically rated for visual acuity and glare tolerance. The subjects undertook on-road driving tests which evaluated their seeing distances while driving cars equipped with different headlighting systems, including the proposed high intensity systems.

The conclusion of the NHTSA research, supported by the findings of other expert researchers, is that the safety of night driving on the upper beam would be improved by the proposed level of intensity, with only minor degradation of seeing distance from misuse of that beam. Glare is a problem even at intensities below 75,000 candlepower. As headlight intensity increases to 150,000 candlepower there is an increase in disability glare, however it is less than proportionate to the increase in tensity. The 20 percent increase in seeing distance when no car is approaching contrasts favorably with the minor degradation in the worst case, when the upper beam is misused. In that case, when two vehicles utilizing 150,000 candlepower headlamps approach each other on the upper beam and both fail to switch to lower beam, seeing distance is reduced only approximately 1.5 percent when compared to a corresponding situation involving vehicles utilizing 75,000 candlepower headlamps. This minor degradation from increased disability glare is transient. Furthermore, high intensity headlights are more readily noticeable and may improve the response of opposing drivers to signals to dim upper beam headlights. NHTSA also recognizes that the level of disability glare experienced when driving is considerably more sensitive to highway environmental factors than to headlight intensity.

In addition to its research, NHTSA has been sensitive to the views of those drivers who report that they are bothered by glare from headlamps of the levels of intensity now permitted. NHTSA has reviewed its own research and has uncovered no data indicating that disability glare (that glare which reduces seeing ability) from current headlamps creates a driving hazard to the average vehicle operator or to older drivers. Discomfort glare varies with drivers, however, and generally the eyes of older drivers are more sensitive to stronger lights whatever their sources.

II. Headlamp Lens Markings

Notice 1 proposed that the lenses of the new high intensity headlamps be marked with an identification code and with the letters "DOT" constituting a certification that the lamps comply with applicable Federal motor vehicle safety standards.

As was to be expected, this aspect of the proposal was of little interest to the general public. Comments were received only from States, manufacturers, and one retailer. Industry did not express strong support for the proposed code, preferring instead to allow each manufacturer to retain its own system of trade numbers as a means of headlamp identification. Most requested that sufficient time be allowed to implement the new code if NHTSA decided to adopt it.

NHTSA has decided to adopt the code as proposed with an effective date of July 1, 1979. The lenses of headlamps have contained a lens code for several decades as a means of identification and the rule extends the practice in a logical fashion. Trade numbers are not only more numerous than the code characters, but they are changed for specific technical design changes not necessarily related to interchangeability or performance of headlamps. Use of the NHTSA code will simplify lamp replacement for the consumer who will be able to identify a lamp by its universally applicable code number rather than by manufacturers' specific trade number. Since then lens code is visible with the lamp installed and the trade number is not, the code will give consumers and inspection stations a ready means of determining whether a balanced lighting system is installed on the vehicle. The proposal did not specify the minimum size of the characters, and the amendment will allow the manufacturer to choose the size and location on the lens most appropriate for his lamp design.

The great majority of comments opposed mandating use of the "DOT" symbol on the lens. Many felt that placing it above the lens marking code would interfer with beam refraction. Others commented on the cost that would be incurred in changing lens molds. Some suggested that the size and placement of the characters be the manufacturer's choice. Two commented that they felt the proposal was illegal under section 114 of the National Traffic and Motor Vehicle Safety Act which allows equipment items to be certified by a label or tag on the shipping containers as an alternate means to certification on the item itself.

The NHTSA has decided to adopt the proposed means of lens certification as mandatory for the new headlamps, effective July 1, 1979, with the size and placement of the "DOT" characters to be decided by the manufacturers. Thus, there need not be a problem of light interference and the lens mold may be changed at the same time for both the marking and certification code changes. The agency rejects the argument that it is illegal under section 114 to require items of equipment to bear certification markings. Such a requirement is well within the discretion accorded the Administrator under the act and general legal principle, and is consistent with the intent of the framers of the act. The NHTSA currently requires equipment items such as tires and brake hoses to bear the DOT symbol as mandatory certification.

III. HEADLAMP WATTAGE

Comments were made on the proposed headlamp wattages requesting increases, decreases, and minor changes. In the proposal the 2A1 headlamp was specified as 40 watts for upper beam and all comments on watts indicated that it should be a higher figure, generally 43 watts. The NHTSA agrees and accordingly has revised the 2A1 wattage to 43 watts.

The wattage for a system using 2A1 lamps would then be 6 watts or 3 percent higher than a system using 2C1 headlamps, whereas the two systems should be allowed the same level of performance. Since there should be no vehicle electrical problems associated with a 3-percent change in a headlamp intended for the aftermarket, the 2C1 headlamp is provided the same maximum of 43 watts on upper beam.

The proposed type 2D1 headlamp wattage of 70 watts for upper beam and 65 watts for lower beam exceeds present system wattages by 15 percent. This value would have provided the same wattage (and therefore performance) for all low beams of all systems and would have provided equivalent performance to the 2B1 headlamp system on upper beam. The comments and NHTSA information both indicate that an attempt to equate systems to this degree could possibly cause some electrical problems on older vehicles using the new lamps as replacement headlamps. Because of this concern of the aftermarket the NHTSA is reducing the wattage of the 2D1 headlamp to 65 watts for upper beam and 55 watts for lower beam.

Some comments recommended only a 1-watt change for some lamps. Such a minor change is insignificant to the effect of lighting performance on vehicle electrical systems and therefore the NHTSA has retained the same values as proposed.

IV. INCLUSION OF SAE J580b

The proposal to substitute SAE Standard J580b, *Sealed Beam Headlamp*, occasioned some comment. Among other things, J580b requires that headlamp aim be adjustable without removal of trim rings or other vehicle parts.

While it is believed that most of the industry currently conforms to this requirement, several manufacturers commented that leadtime will be required to implement this change. The NHTSA has therefore decided to defer mandatory compliance with this portion of J580b until October 1, 1979.

V. Miscellaneous Changes

In the proposed deletion of paragraph S4.1.134, the allowance of two Type 2B1 headlamps on motorcycles was inadvertently deleted and is hereby reinstated. Notice 1 also indavertently omitted allowance of current low intensity headlamps on passenger cars and motor vehicles less than 80 inches in overall width. This was corrected by Notice 2 (43 FR 16783) and is retained in the amendment.

VI. Other Issues

A sizable number of comments from individuals and suppliers felt that there should be no amendment of existing headlamp requirements without consideration being given to unsealed headlighting systems that meet European standards.

In brief, these headlamps, popularly known as "quartz halogen", do not meet Standard No. 108's requirements for sealed beam construction, and mechanical aimability. Many unsealed systems also exceed the newly increased candlepower maximum of 150,000. These commenters frequently attacked the sealed beam concept as "outmoded" and "40 years behind the times", espouse the do-it-yourself philosophy of headlamp aim, and praise the "superior" lighting provided by their imported unsealed headlamps.

These issues are generally not within the scope of the rulemaking proposal under consideration, but have been considered, where appropriate, as supportive of a desire for better headlighting. It is felt that the sealed headlamps that will be shortly available by virtue of this rulemaking action, which NHTSA understands will utilize the halogen cycle, will provide the brighter lighting that many people seek. The NHTSA has always expressed its willingness to consider alternate technologies supportable by objective data upon which safety performance standards can be based. In recognition of the public interest in the issue, NHTSA has placed relevant public correspondence and other materials in a general reading file "Halogen Headlamps" available for inspection in Room 5108 at 400 Seventh Street, SW., Washington, D.C.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is hereby amended . . . .

In evaluating the cost impact of this rulemaking action, the NHTSA has concluded that there will be none with respect to headlamp manufacturers as the amendment provides an optional means of conformance to Standard No. 108. With respect to the requirement of J580b that headlamps be adjustable without removal of trim, it is believed that most manufacturers already comply. Those who do not may find it necessary to modify trim or sheetmetal or grille parts on a one-time basis but it is concluded that these modifications would be minor and that no significant costs would be incurred.

Because the amendment with respect to candlepower relieves a restriction it is made effective July 27, 1978.

The lawyer and program official principally responsible for this rule are Z. Taylor Vinson and Bill Eason, respectively.

(Secs. 103, 112, 114, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407); delegation of authority at 49 CFR 1.50.)

Issued on July 20, 1978.

Joan Claybrook
Administrator

43 F.R. 32416
July 27, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Motor Vehicle Lighting

(Docket No. 77–1; Notice 2)

This notice amends Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to specify that rear side marker lamps on large trailers cannot be located higher than 60 inches above the road surface. This action was taken to achieve regulatory consistency with a parallel action of the Federal Highway Administration's Bureau of Motor Carrier Safety (BMCS) which has acted pursuant to a petition by the International Brotherhood of Teamsters, Chauffers, Warehousemen and Helpers of America ("Teamsters Union"). The effect of the limitation will be to make it more likely that the trailer rear side marker lamp can be viewed in the outside rear view mirror of the tractor pulling it, acting as a reference light by which the tractor driver may check the tracking of the trailer's rear end.

Effective date: March 1, 1979.

For further information contact:

> Marx Elliott, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590, 202–426–1714.

Supplementary information: On January 17, 1977, NHTSA proposed (42 FR 3187) that rear side marker lamps on trailers with an overall width of 80 inches or more be located "as far to the rear as practicable and as close as practicable to the lower rear corner". The existing requirement is that they be "as far to the rear as practicable" and "not less than 15 inches" above the road surface. This action was taken as a parallel to rulemaking conducted by BMCS which had the following history. BMCS published an advance notice of intent to amend 49 CFR 393.14 to require large semitrailers and full trailers operating in interstate commerce to have the rear side marker lamps at or near the lower rear corner (40 FR 31959). The purpose of the proposal was to enhance traffic safety by providing a driver of a tractor pulling such a trailer with a reference light visible in the outside rearview mirror through which he may check the tracking of the trailer's rear end at night or at such other times as the headlamps are required. The NHTSA tentatively determined that a companion amendment of Standard No. 108 was required to preclude a conflict between the requirements of that standard and the BMCS Regulations.

BMCS, having evaluated the comments to the Advance Notice, proposed (41 FR 47948) that rear side marker lamps be "as near as practicable to the lower rear corner, and visible in the rearview mirror of the truck tractor when the trailer is tracking straight behind the tractor." The NHTSA proposal required only that the lamps be located as close as practicable to the lower rear corner. The difference in requirements was dictated by the different safety missions of the two issuing agencies—that of NHTSA, to insure that motor vehicles are manufactured in accordance with Federal motor vehicle safety standards, and that of BMCS, to insure that commercial vehicles in interstate commerce are operated in accordance with that agency's safety requirements. Federal motor vehicle safety standards do not apply to a combination of vehicles (tractor and trailer) and it would not be possible to determine at time of manufacture whether the rear side marker lamp of the trailer would be visible in the rearview mirror of every possible tractor that could tow it.

Fifteen comments were received on the proposal, 11 supporting the reasoning relative to the relocation of the side marker lamp. Six of these, however, recommended that the agency consider establishing a mounting height range due to peculiarities of certain trailer designs. For example, side marker lamps mounted at the lowest position on trailers designed to carry snowmobiles, motorcycles, or boats would be subject to water, dust, mud and road debris. The R. E. Dietz Company supported the concept of a tracking light but suggested that a special light be provided for that purpose. The proposal was objected to by, among others, the Truck Safety Equipment Institute (TSEI), because it would eliminate the presnt option of allowance of a combination clearance—side marker lamp, mounted higher than 60 inches and because low mounted side marker lamps would not necessarily be visible in tractor rear view mirrors. The Recreational Vehicle Industry Association joined TSEI in objecting on the ground that an option would be eliminated. It also cited potential problems with obscuration by mud or other road matter. Truck Trailer Manufacturers Association was not convinced that the location of the side marker lamp was such an important safety matter that it needed coverage by a Federal regulation. Concern was also expressed that the amendment would not achieve its purpose unless the marker lamps were required to project light toward the towing vehicle, and unless a candlepower output for that light was required.

NHTSA concurs with those commenters who expressed concern about low-mounted side marker lamps, and who suggested that a mounting height range from 15 to 60 inches would be preferable, and has decided to amend Standard No. 108 to reflect this comment. BMCS is joining NHTSA in a companion amendment published today. Such a range will also afford a manufacturer more flexibility with respect to trailers of unique design, and should also come closer to the goal of providing visibility of a reference light in the mirrors of various sized towing vehicles. NHTSA realizes that the clearance—side marker lamp option will no longer be available for those trailers on which the clearance lamp is at a height greater than 60 inches, but has concluded that a height limitation must be adopted to insure a greater likelihood that the purpose of the rulemaking action is achieved. Adequate lead time is being afforded for design modifications. With respect to visibility of the side marker lamp by the driver, it is true that a lamp meeting Standard No. 108's minimum requirement that it be visible at a 45 degree angle from its mounting plane might not provide the reference light desired, but in common practice most of the rear side marker lamps appear to exceed this angle and should be visible in the rear view mirror. Further, NHTSA believes that the light output of current side marker lamps is sufficient to provide the desired cue.

In consideration of the foregoing Table II of 49 CFR 571.108 Motor Vehicle Safety Standard No. 108 is amended. . . .

The program official and lawyer responsible for the development this amendment are Marx Elliot and Taylor Vinson, respectively.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50).

Issued on August 25, 1978.

Joan Claybrook
Administrator

43 F.R. 38832–38833
August 31, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 78-08; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Motor Vehicle Safety Standard No. 108 to increase the maximum permissible candlepower for single compartment tail lamps while extending requirements for contrast between stop (signaling) and tail (marking) functions at test points below the horizontal. This action is taken in response to a petition for rulemaking from industry. The effect of the increase will be to relieve a burden on manufacturers who must monitor production closely to insure continuing compliance of existing lamp designs with the existing limitation.

EFFECTIVE DATE: The amendment is effective immediately but compliance with the contrast requirements is not mandatory until July 1, 1980.

FOR FURTHER INFORMATION CONTACT:

Marx Elliott, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2720).

SUPPLEMENTARY INFORMATION: A limit of 15 candlepower on photometric output at test points on or above the horizontal is imposed on single compartment tail lamps by 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment.* The intent of this limitation is to eliminate the possibility of excessive glare, and to insure that the ratio between stop lamps and tail lamp output offers sufficient contrast that the stop function can be readily identified when it is actuated.

On February 18, 1977, Truck Safety Equipment Institute (TSEI) petitioned for rulemaking to amend Standard No. 108 to increase the permissible maximum output of single compartment tail lamps to 18 candlepower. This figure is derived from SAE Recommended Practice J256a Service Performance Requirements for Motor Vehicle Lighting Devices and Components, June 1972, which permits tail lamp output to be 120 percent of the maximum value specified in SAE Standard J585d, Tail Lamps (Rear Position Light) August 1970. The reason for TSEI's request is that the 15 candlepower limitation has become "an unnecessary burden on manufacturers who must attempt to monitor their productions in an attempt to insure a strict compliance with this maximum output". TSEI argued that an increase would have no detrimental effect upon safety because there has been no limitation on candlepower output below the horizontal and it was reasonable to assume that there must be countless driving situations every day "where the following driver is exposed to lamp candlepower outputs from approximately 15 cp to 22 cp" without any evidence of hazardous driving conditions because of glare. The basis of the petition, therefore, was that a restriction should be relaxed for economic reasons, and that the relaxation will have a neutral effect upon safety. The NHTSA granted TSEI's petition for rulemaking and proposed that the maximum output of single compartment tail lamps be raised to 18 candlepower, and that the current ratio of candlepower output by stop and tail lamps in combination lamps be maintained at test points above the horizontal and extended to test points below the horizontal to minimize problems of glare. NHTSA proposed the extension of the ratio to test points below the horizontal to provide protection equivalent to that at points above the horizontal. Standard No. 108 allows combination stop and tail lamps to be mounted as high as 72 inches above the road surface while in today's passenger cars the driver's eye point is much lower, only 38 inches to 48 inches above the road surface.

A notice of proposed rulemaking was published on this subject on May 4, 1978 (43 FR 19250), and an opportunity afforded for comment.

Twenty-seven comments were submitted on the proposal. There was one objection to the increase in candlepower, and two to extension of contrast ratios. All other comments supported it.

An important suggestion made was that NHTSA adopt SAE Standard J585e, September 1977 as the referenced standard on tail lamps since the SAE revision encompassed both of NHTSA's proposals. NHTSA concurred with this recommendation and is amending the standard in this fashion. J585e is otherwise identical to J585d except for the addition of a final sentence to Note 4 which prescribes an alternative way for computing the candlepower ratio for combination lamps when certain conditions are met.

The Japanese Automotive Manufacturers Ass'n. Inc. (JAMA), objected to the extension of the contrast ratio, principally because of its effect upon the motorcycle industry. In JAMA's opinion there is no need for the requirement to cover motorcycles as lamps are not mounted at a height greater than 38 inches. NHTSA does not concur with this comment. The amendment will insure that there is no confusion when the driver's eye reference point is lower than the average 38 to 48 inches above the road surface. This situation could occur when a motorcycle is on a hill in front of the driver of another vehicle. The mandatory compliance date of the requirement, July 1, 1980, should afford sufficient time for tooling of new lamps if needed.

Chrysler Corporation commented that it saw no need to adopt intensity ratio requirements for the test points below horizontal since photometric requirements for tail and stop lamps are the same, whether above or below horizontal. While the requirements are the same, the values prescribed are minimal and a manufacturer may establish its own values above the minimum level. NHTSA has concluded that the amendment would assure that the ratio now required above the horizontal would also be maintained below. It would also avoid use of the wrong replacement lamps or lens.

California Highway Patrol suggested that test point 5 D-V should be added to those at which not less than a 5 to 1 ratio is required. The NHTSA cannot add it at this time since it was not part of the rulemaking proposal, but consideration will be given to it in future rulemaking.

American Motors Corporation supported the proposal but commented that the 120 percent value specified in J256a should apply to all tail lamps and not just single compartment designs. This suggestion is beyond the scope of the proposal and NHTSA will consider it in future rulemaking.

Dry Launch suggested an increase from 15 to 20 and 25 candela. This suggestion was also considered beyond the scope of the proposal. Those values are permitted for two and three compartment lamps because the light sources are distributed, and NHTSA does not believe that excessive glare should be risked by increasing the maximum from 18 to 20 or 25 candela for single compartment lamps.

The proposal was objected to by G. F. Meese in whose opinion the upper limit should be 10 candela because excessive brightness irritates following drivers. The NHTSA did not agree with this comment. There appear to be instances in which the upper limit of 10 candela, which is being proposed by Mr. Meese, has been exceeded, and there is no indication that this causes any hazardous driving conditions because of glare.

In consideration of the foregoing 49 CFR 571.108, Motor Vehicle Safety Standard No. 108 is amended as follows:

1. Paragraph S4.1.1.28 is revised to read:

S4.1.1.28 Each tail lamp on any motor vehicle manufactured before June 1, 1980 may be designed to conform to SAE Standard J585d, Tail Lamps, August 1970.

2. Table I and Table III are amended so that the applicable SAE Standard for tail lamps in the final column of each Table is "J585e, September 1977."

In accordance with Department of Transportation policy encouraging adequate analysis of the cost and other consequences of regulatory actions (41 FR 16201, April 16, 1976), the NHTSA has evaluated the economic and other consequences of this amendment on the public and private sectors and has concluded that there is no cost increase required by an allowance of an increase in candle power in single compartment tail lamps. While there should be no increase associated with maintenance of contrast ratios at test points below the horizontal in combined lamp configurations, the NHTSA requested comments on this factor and received none.

The program official and lawyer responsible for the development of this proposal are Marx Elliott and Taylor Vinson, respectively.

Issued on December 13, 1979.

Joan Claybrook
Administrator

44 F.R. 75385
December 20, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 69-19; Notice 18)

ACTION: Final rule.

SUMMARY: This notice finalizes the interim amendment of Motor Vehicle Safety Standard No. 108 adopted effective September 1, 1978, which retained the requirement that stop lamp lenses on motor driven cycles be a minimum of 3½ square inches.

EFFECTIVE DATE: The amendment is effective immediately.

FOR FURTHER INFORMATION CONTACT:

Marx Elliott, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2720).

SUPPLEMENTARY INFORMATION: On August 31, 1978, the agency published an interim rule and request for comments (43 FR 38831) deleting the requirement that low-speed motor driven cycles (mopeds) have larger stop lamps effective September 1, 1978, and asking whether the amendment should be made permanent. NHTSA noted it did not intend to include these vehicles in earlier amendments increasing the size of stop lamp lenses from a minimum of 3½ square inches to 8 square inches. The agency believed that moped conspicuity and safety would be reduced if lamps on these low-powered vehicles were required to have a larger lens area without being required also to have higher light output. The effect of the interim amendment, therefore, was to retain the existing requirements.

Three comments were received in response to that Notice. Two supported the rule but the California Highway Patrol opposed it on the basis that moped rear lighting needs improvement. As noted above, simply reinstating the requirement for increased lens area would not improve safety. However, the agency intends to ask for comments in the near future on this aspect of moped safety.

In consideration of the foregoing, NHTSA hereby makes final the interim revision of paragraph S4.1.1.27 of 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, adopted on August 31, 1978.

The program official and lawyer responsible for the development of this rule are Marx Elliott and Taylor Vinson respectively.

Issued on February 19, 1980.

Joan Claybrook
Administrator

45 F.R. 13736
March 3, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 77-1; Notice 4)

ACTION: Correction.

SUMMARY: This notice corrects a typographical error in the notice of correction published on December 28, 1978 (43 FR 60472). The error appears in the designation of the table, identifying it as "Table III" when the correct designation is "Table II". The effect was to change the heading of the last column in Table III from "Applicable SAE standard or recommended practice" to "Height above road surface measured from center of item on vehicle at curb weight". It is therefore necessary to correct the heading to Table III.

FOR FURTHER INFORMATION CONTACT:

W. Marx Elliott, Office of Rulemaking National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (202-426-2720).

Accordingly, Title 49, Code of Federal Regulations, § 571.108 is amended to read:

TABLE III.—*Required Motor Vehicle Lighting Equipment*

Item	Applicable SAE standard or recommended practice
* * *	* *

The lawyer and program offical principally responsible for this correction are Z. Taylor Vinson and W. Marx Elliott, respectively.

Issued on February 28, 1980.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

45 F.R. 14577
March 6, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 78-12; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Motor Vehicle Safety Standard No. 108 to allow an optional method of measuring side marker lamp light output for all vehicles less than 30 feet in overall length, regardless of width. This option currently applies to all vehicles less than 80 inches in overall width, regardless of length. This amendment is in response to a petition for rulemaking submitted by Chrysler Corp. The effect of the amendment is to remove a restriction on vehicles which are normally built in versions less than 80 inches in overall width but which have derivatives that exceed this dimension.

EFFECTIVE DATE: Date of publication of final rule. Since the amendment relieves a restriction, it may be made effective immediately, July 3, 1980.

FOR FURTHER INFORMATION CONTACT:

John Simeroth, Crash Avoidance Division,
Office of Vehicle Safety Standards,
National Highway Traffic Safety
Administration, 400 Seventh Street, S.W.,
Washington, D.C. 20590 (202-426-2715)

SUPPLEMENTARY INFORMATION: A Notice of Proposed Rulemaking on this subject was published on September 7, 1978 (43 FR 39839).

Standard No. 108 requires the photometric requirements for side marker lamps to be met at test points 45 degrees outboard and inboard of the lateral center line passing through the lamp. However, if a vehicle is less than 80 inches in overall width, paragraph S4.1.1.8 of Motor Vehicle Safety Standard No. 108 allows photometric measurements of side marker lamps to "be met for all inboard test points at a distance of 15 feet from the vehicle and on a vertical plane that is perpendicular to the longitudinal axis of the vehicle and located midway between the front and rear side marker lamps." This results in a measurement of less than 45 degrees instead of a fixed 45 degrees.

Chrysler Corp. petitioned that the option be available to all vehicles regardless of width. In its opinion, the effect of differing requirements imposes needless restrictions on smaller size vehicles normally built in versions less than 80 inches but which have special derivatives which exceed this width:

"For example, a pick-up truck may be designed with wraparound front or rear lamps [that meet S4.1.1.8]. If dual rear wheels are installed on this same vehicle, its width will exceed 80 inches and different side marker lamp requirements will apply * * * [and] auxiliary lamps may have to be used on these wider vehicles."

The NHTSA agreed with Chrysler's views, but with the reservation that the exception should not apply to vehicles whose overall length is 30 feet or greater. None of these vehicles are currently eligible for this option since all exceed 80 inches in overall width. Those vehicles are required to have an intermediate side marker lamp that is centrally located between the front and rear side marker lamps. All three markers need to be clearly visible to motorists from the side so that the overall vehicle size is evident. Thus, for vehicles 30 feet or longer the 45 degree visibility angles are more appropriate than the provisions of paragraph S4.1.1.8. Accordingly, it was proposed that S4.1.1.8 of 49 CFR 571.108 Motor Vehicle Safety Standard No. 108 be revised by deleting the words "80 inches in overall width" and substituting "30 feet in overall length."

Six comments were received in response to the Notice of Proposed Rulemaking, all of which supported it. Typical was the opinion of American

Motors that it is inappropriate to have differing side marker requirements based on a criterion related to vehicle width when the primary purpose of the lamp is to indicate overall length.

In consideration of the foregoing, paragraph S4.1.1.8 of 49 CFR 571.108, Motor Vehicle Safety Standard No. 108 is revised as follows:

§571.108 Motor Vehicle Safety Standard No. 108

* * * *

S4.1.1.8 For each motor vehicle less than 30 feet in overall length, the photometric-minimum candlepower requirements for side marker lamps specified in SAE Standard J592e "Clearance, Side Marker, and Identification Lamps," July 1972, may be met for all inboard test points at a distance of 15 feet from the vehicle and on a vertical plane that is perpendicular to the longitudinal axis of the vehicle and located midway between the front and rear side marker lamps.

The agency has considered the impacts of this amendment under Executive Order 12044, "Improving Government Regulations," and determined that they are not significant. Further, the impacts are so minor as not to warrant the preparation of a regulatory evaluation. The effect of the amendment is to relieve a minor restriction under which a manufacturer in certain circumstances would have to provide an additional or modified side marker lamp.

The program official and attorney responsible for developing this amendment are John Simeroth and Taylor Vinson respectively.

Issued on June 26, 1980.

Joan Claybrook
Administrator

45 FR 45287
July 3, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 69-19; Notice 19)

ACTION: Final rule.

SUMMARY: This notice amends Motor Vehicle Safety Standard No. 108 by supplementing an amendment published on January 5, 1976 (49 FR 765) which adopted SAE Standard J588e, Turn Signal Lamps, September 1970 as the referenced standard for that item of lighting equipment. The effect of the amendment was to increase the minimum effective projected luminous area of all turn signal lamps but a corresponding change was not made in the maximum allowable candlepower for single and triple compartment yellow rear turn signal lamps in Figure 1. This notice effects that change.

EFFECTIVE DATE: Since the amendment imposes no new substantive requirements it is effective upon publication in the *Federal Register*, July 29, 1980.

FOR FURTHER INFORMATION CONTACT:

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20590 (202-426-2720)

SUPPLEMENTARY INFORMATION: Standard No. 108 was amended in January 1976 to incorporate SAE J588e as the referenced standard on turn signal lamps. Table 1 of J588e establishes maximum candlepower restrictions for rear lamps, different than those in effect under J588d, its predecessor with respect to single and triple compartment yellow turn signal lamps. When J588e was adopted, a corresponding change was not made to Figure 1 of Standard No. 108 which sets out the photometric minimum candlepower requirements calculated using the "Group" or zonal method. This amendment to Figure 1 corrects that error.

In consideration of the foregoing, Figure 1 of 49 CFR 571.108, Motor Vehicle Safety Standard is amended to read:

GROUP TOTALS, CP

Groups * *	Tail lamps	Red stop and turn signal lamps	Yellow turn signal lamps
	* * *	* * *	one * three
Maximum rear lamps only	* * *	* * *	750 * 1050

The program official and lawyer primarily responsible for the development of this amendment are John Simeroth and Taylor Vinson, respectively.

Issued on July 21, 1980.

Joan Claybrook
Administrator

45 FR 49941
July 28, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment
(Docket No. 81-17; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Saety Standard No. 108 to delete the dimensional requirements for all headlamp retaining rings. It implements the grant of a petition for modification of Dimension "K", specified in SAE Standard J571d for retaining rings of headlamps. The primary purpose of this amendment is to remove a design restriction and associated administrative and compliance burdens upon the automotive industry. The amendment was proposed on October 13, 1981 (46 F.R. 50394).

EFFECTIVE DATE: June 10, 1982.

SUPPLEMENTARY INFORMATION: Safety Standard No. 108, *Lamps, Reflective Devices and Associated Equipment* (49 CFR 571.108), incorporates by reference SAE Standard J571d "Dimensional Specifications for Sealed Beam Headlamp Units," June 1976. Toyota Motor Sales, USA, Inc. informed NHTSA that it had developed a new retaining ring for a four lamp rectangular headlamp system which combined the function of the previously separate headlamp door (mounting ring) and the retaining ring. The new ring is lighter in weight by 0.2 kg than the old ring and its use makes it easier to replace a headlamp. But in order to allow it, Toyota argued that Dimension "K" as specified in Figure 8(A) of SAE J571d should not be limited to a maximum of 1.52 mm, and it petitioned the agency for rulemaking to eliminate Dimension K. Having been assured that the new design does not interfere with use of a mechanical aimer, NHTSA granted the petition.

Upon its review of Standard No. 108 the agency concluded that it should go beyond the scope of the petition and that deletion of all retaining ring design requirements would not compromise motor vehicle safety. This appeared to be one of those Federal regulations that can be rescinded, thereby relieving a burden, if only a small one, on vehicle manufacturers. The necessary compliance and associated administrative tasks will be removed and therefore implementation of the proposal should have a positive economic impact. Retaining ring dimensions specified in SAE Recommended Practice J1132, applicable to two-lamp rectangular headlamp systems, are also eliminated.

In response to the notice of proposed rulemaking published on October 13, 1981, the agency received six comments, five of which endorsed the agency's planned action. The sixth comment, from Hopkins Manufacturing Corporation, a producer of mechanical aiming devices for headlamps, expressed concern that without a limitation on Dimension "K", there could be interference between the retaining ring and the aiming head, thus preventing the use of a mechanical aimer. However, the agency has concluded, as did several of the commenters, that certain performance requirements specified in SAE J580b "Sealed Beam Headlamp Assembly," February 1974, adequately guarantee compatibility between the retaining ring and the headlamp. Specifically, paragraph S5.1 requires that "Headlamps shall be designed so that they may be inspected and aimed by mechanical aimers . . . without removal of any ornamental trim rings or other parts." This means simply that the headlamps, when installed on the motor vehicle, must be mechanically aimable.

The agency has considered thus rulemaking action and determined that it is not a major regulation under Executive Order 12291 "Federal Regulation," or a significant regulation under the departmental regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. Amendment of the standard will impose no additional requirements but will allow manufacturers flexibility to adopt retaining ring designs with dimensional specifications that may now be precluded by strict adherence to the SAE requirements incorporated in Standard No. 108. The cost effects of utilizing the new retaining rings would be minimal.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. NHTSA certifies that amending Standard No. 108 to eliminate dimensional requirements for retaining rings will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Based on available information, the agency believes that few, if any, of the retaining ring manufacturers are small businesses as that term is defined for purposes of the Flexibility Act. Businesses which make or install the new retaining rings and small organizations and government jurisdictions which purchase fleets of motor vehicles will not be significantly affected. Retaining rings will continue to be required and provided, in most instances probably unchanged from current ones. The difference in cost of vehicles equipped with current retaining rings and those of a different design will be insubstantial at most.

Issued on June 4, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 25149
June 10, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Motor Vehicle Lighting

[Docket No. 81-16; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Motor Vehicle Safety Standard No. 108 to substitute SAE Standard J594f for J594e as the referenced standard on reflex reflectors. This amendment is in response to a petition for rulemaking submitted by Motor Vehicle Manufacturers Association (MVMA). A notice of proposed rulemaking was published on October 13, 1981 (46 F.R. 50396). The effect of the amendment is to increase the diameter of the circumscribing circle for the photometric test from 7 to 10 inches.

DATE: Effective date is December 20, 1982.

SUPPLEMENTARY INFORMATION: Standard No. 108 requires that reflex reflectors be designed to conform to SAE Standard J594e *Reflex Reflectors*, March 1970. Section J "Photometry" of the Standard specifies that "reflex reflectors may have any linear or area dimensions, but for the photometric test a maximum of 12 square inches contained within a 7 inch diameter circle shall be exposed." In January 1977 the SAE adopted J594f which increased the diameter of the test circle to 10 inches. MVMA petitioned the agency to substitute J594f as the referenced standard on reflex reflectors aguring that it will relieve a design restriction and permit greater latitude in reflector design with no decrease in safety performance.

Specifically, MVMA noted that the increase in minimum requirements for lens area of rear turn signal lamps from 3.5 to 8 inches adopted by NHTSA in 1976 has resulted in increased use of reflex material in the form of horizontal or vertical strips as well as material incorporated within the lenses. But some types of designs are prohibited by current requirements that would be allowable when 12 square inches of reflex material are circumscribed by a circle with a diameter increased from 7 to 10 inches. The performance requirements of this reflective material itself would remain unchanged.

In the proposal NHTSA pointed out the following additional differences between the two standards. The option of using visual measurements for determining photometric performance will be eliminated. This change will result in a greater comparability of test results between manufacturers and NHTSA, which uses photometric rather than visual measurements, thus reducing the likelihood of disagreements when agency tests indicate photometric performance does not meet the standard. In addition, a new Table I is provided, "Minimum Milli-candelas per Incident Lux for Red Reflex Reflectors," the current table becoming "1A." The new table is the equivalent of the old in metric units. Either table may be used, a fact not made clear by J594f.

Nine comments were received on the proposal, all of whom supported it. The majority approved of the removal of a design restriction. The Traffic Control Materials division of 3M Corporation suggested updating Federal Specification L-S-300 which has been revised three times since September 1965, the version cited in S4.1.1.4. However, because such an amendment was beyond the scope of the original proposal and the public has not had an opportunity to comment upon it, this recommendation was not adopted.

The agency's preliminary examination has shown that this rulemaking action is not a major regulation under Executive Order 12291 "Improving Government Regulations," or a significant regulation under the Department's regulatory policies and procedures, and that a regulatory impact analysis is not required. Further, the costs impacts will be so minimal that preparation of a full regulatory evaluation is not warranted. Amendment of the standard will impose no additional manufacturer requirements but will allow producers flexibility to adopt reflex material designs that are now precluded by the current requirements of Standard No. 108. The cost savings resulting from taking advantage of that flexibility would be insubstantial. Although visual measurements for determining photometric conformance will be eliminated, the cost of substituting photometric measures should be minimal. NHTSA believes that most manufacturers, as the best assurance of compliance, have relied on photometric measurements in the past.

Issued on November 9, 1982.

Raymond A. Peck, Jr.
Administrator
47 F.R. 51883
November 18, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 82-17; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 108 to allow motor vehicles to be equipped with a new two-lamp rectangular sealed beam headlamp system. The individual lamps in the system will be smaller than those currently allowed in two-lamp systems. The new headlamps have external dimensions identical to those of headlamps used in four-lamp rectangular headlamp systems. The headlamps are required to be designed to conform to performance levels of the presently existing Federal standards met by other headlamps.

DATE: Effective date of the amendment is 30 days after publication in the *Federal Register*. Because of the necessity of manufacturers to meet tooling deadlines, it is found for good cause shown that an effective date earlier than 180 days after issuance of the rule is in the public interest.

SUPPLEMENTARY INFORMATION: Chrysler Corporation petitioned for rulemaking to amend Standard No. 108 to permit the use of a new, smaller, rectangular dual-beam sealed beam headlamp in a two-lamp system. The lamp, which was developed by Wagner Electric Corporation, has the same external dimensions as the rectangular headlamps used in four-lamp systems, and is designed to meet the same photometric requirements as the larger lamp currently used in rectangular two-lamp systems.

The change was requested by Chrysler in order to allow aerodynamic improvements in vehicle front end designs which will result in increased fuel economy. The current four-lamp system of units of identical size is limited in application because of infringement of the extra pair of headlamps upon the amount of grille area required for engine cooling. This will become increasingly critical as the front edges of cars become more rounded in designs planned by the industry for vehicles to be introduced in the mid-1980's.

The new system will use halogen bulbs from Type 2B headlamps, the reflector from the current Type 2A headlamp, and a modified lens. In addition, the lamp ground terminal will be rotated 45 degrees to ensure that Type 1A or Type 2A lamps cannot be inserted as replacements.

To meet the agency's previously expressed concern over proliferation of headlamp types and the consequent possibility that some of them may not be readily available, Chrysler's suppliers, Wagner, General Electric, and GTE Sylvania, have reported that the lamp will be distributed to the field through their normal distribution centers and marketing channels. Thus, the lamps will be available at "well over ten thousand retail sales outlets." Service Parts Division at all of Chrysler's 20 parts depots would stock the new headlamps to supply dealers nationwide.

Because the new headlamp would be derived basically from components of current headlamps, Chrysler estimated that there will be a "considerable" cost decrease over the current larger halogen dual rectangular lamps.

Chrysler also argued that the environmental effects of the new system are all positive, and include reduction in both fuel consumption and raw materials used in lamp manufacture. It is aware of no alternatives which would produce the same level of public benefits.

NHTSA granted the Chrysler petition on October 8, 1982, and published a notice of proposed rulemaking on October 14, 1982 (47 FR 45890).

The agency, in essence, asked three questions in the proposal—whether the performance of a small two-lamp system can meet the needs of motor vehicle safety, whether it would not be better to require such a system to "conform" to the specified requirements instead of being only "designed to conform" with them, and whether the addition of a new headlamp type to the existing types would over-burden the existing distribution system so that replacement headlamps would be difficult to find.

In response to the proposal, NHTSA received 14 comments, including one from Chrysler. Virtually all supported an amendment which would allow the new system; virtually all opposed the proposal that the new headlamp be required to "conform" to specified requirements.

In response to an earlier notice (Request for comments, August 31, 1981; 46 Fed. Reg. 43,719) on new headlighting systems, several commenters had expressed concern about the implications of the possible changes for the simplicity and ease of manufacturing headlamps. In terms of these considerations, the optimum headlamp appears to be one having a relatively large diameter and a single beam. If a headlamp is smaller, contains more than one beam or has a noncircular shape, its photometrics are more difficult to control. Two of those parties who had previously criticized the concept of a system using smaller headlamps, BMW and Koito, did not comment on the current proposal. Volkswagen of America, a previous critic, voiced no objection to the smaller headlamp *per se,* though indicating its preference lay in other directions. California Highway Patrol concurred with the proposal but asked whether the smaller lamp could produce as good a road-lighting beam as a larger headlamp with the same size filament.

NHTSA has carefully reviewed all comments. The fact that the new smaller headlamp is required to meet the same photometric requirements as those of other sizes should ensure that roadway lighting on either high or low beam is sufficient for motor vehicle safety. NHTSA anticipates that manufacturers of these headlamps will maintain quality controls sufficient to insure that the photometrics of any lamp chosen at random will meet the minimum required for each headlamp, even if these controls are more rigorous than those required for a four-lamp system. Sealed beam lighting technology is well proven in practice, and lamps whose dimensions are identical to those which would be used in the new headlamp system have been produced for almost ten years now. Thus, problems inherent in start-up production should be reduced to a minimum. NHTSA has concluded that, in spite of theoretical objections, the new lamps should provide equivalent performance while allowing manufacturers to improve vehicle aerodynamics by locating them to best advantage.

Commenters expressed almost universal opposition to the agency's proposal to require that the new lamps "conform" instead of being "designed to conform" with the requirements for those lamps. Because minor deviations at individual test points are not discernible to the naked eye, the commenters believed that very little real safety advantage would accrue from an approach requiring strict adherence to the performance specifications. (The agency is not willing to accept this argument without further study.) Further, commenters argue that the cost of lamps would increase. Similarly, the commenters stated that the administrative burden on the agency would increase because manufacturers finding individual test point failures of a marginal nature would petition under Part 556 for determinations that they were inconsequential as they relate to motor vehicle safety and thus exempt from the statutory requirement for recall and remedy of noncomplying vehicles and equipment. These potential problems have been avoided under the "design to conform" requirements applicable to currently permitted headlamp systems since NHTSA has allowed random occasional failures without concluding that a lamp is noncompliant. Noting that the Society of Automotive Engineers is currently developing a headlamp performance standard, General Electric recommended that NHTSA review the SAE work and consider a new Federal standard instead of attempting to require strict compliance with existing performance requirements.

After reviewing these comments, NHTSA has concluded that if a requirement for strict compliance is to be introduced, it should be done simultaneously for all lamps, not just for one size of headlamp. Therefore, the agency has not adopted this portion of the proposal at this time but believes that the issue of "conform" versus "design to conform" should be considered in the future as a separate issue.

Because six types of headlamps in four sizes are currently permitted under Standard No. 108 and being offered in the United States, the agency raised the issue of proliferation, i.e., whether permitting an additional type would lead to replacement difficulties, either as a result of the failure of supply outlets to carry the new size, or as a result of the discontinuation of a currently permitted, less popular size to make way for the new headlamp. Truck Safety Equipment Institute expressed its concern that the new lamp would be available only through Chrysler dealerships and therefore its cost would tend to be high.

NHTSA has reviewed the proliferation issue and has concluded that the addition of a new type of headlamp should not create a problem. Current rectangular headlamps received wide availability soon after introduction in 1974 and 1977. Given the precedent of this tradition of availability, it is assumed that a similar pattern will evolve if the new lamp is allowed since it is made using parts from existing lamps and similar production machinery. It is true that it will take time for a supply of replacement lamps to become as available as current headlamps. However, Chrysler stated that its dealers will have replacement lamps and that its lamp suppliers are prepared to supply sufficient quantities quickly to handle both production and field replacement markets. Changing to a new design headlamp may cause occasional difficulties in the initial period of introduction, but reasonable solutions appear to be available to eliminate any safety related problems.

Under the amendment issued today, the new headlamp is identified as "2E1", in accordance with the lighting code currently used by Standard No. 108. The amendment specifies that 2E1 headlamps meet the dimensional specifications for Type 2A headlamps (SAE Standard J571d) except that the ground terminal is rotated clockwise 45 degrees. The 2E1 headlamp is required also to meet all requirements of SAE Standard J579c and subreferenced standards applicable to Type 2 headlamp units (these are basically the photometric, beam pattern, and beam color requirements, and laboratory test specifications). The maximum design wattage is 12.8 volts, 70 watts for upper beam, and 60 watts for lower beam. The lamp is also allowed for use on motorcycles.

Issued on May 9, 1983.

Raymond A. Peck, Jr.
Administrator

48 F.R. 21955
May 16, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 3)

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 108 to allow an optional headlighting system that could improve the fuel economy performance of automobiles. The amendment follows a notice of proposed rulemaking published on January 17, 1983 (48 FR 1992).

The amendment is based upon a petition from, and is primarily directed toward a type of headlamp system developed by, Ford Motor Company. Ford wishes to offer on certain 1984 model cars a semisealed headlamp with a standardized replaceable bulb, which it states would conform to a proposed set of environmental performance requirements similar to those adopted by this notice.

DATE: The amendments made by this notice are effective on July 1, 1983.

SUPPLEMENTARY INFORMATION: This notice completes rulemaking initiated by the agency's publication of a notice of proposed rulemaking (NPRM) on new headlighting systems on January 17, 1983 (48 FR 1992). That proposal was issued following the grant of a petition for rulemaking submitted on August 28, 1981, by Ford Motor Company.

Ford Petition

The Ford petition sought an amendment to Standard No. 108 to permit the use of a nonfully sealed headlamp. To ensure the proper performance of the new headlamp, Ford requested the application to it of certain sealed beam headlamp performance requirements and of certain environmental tests.

Ford's new headlamp consisted of two discrete components: a plastic lens bonded to a plastic reflector, and a replaceable light source capsule of standardized design that is inserted through an opening in the rear of the reflector, and sealed by an "O-ring" seal on the capsule. Although contoured, the headlamp is mechanically aimable with an adapter to the current aiming equipment. Ford argued that the possibility of reflector contamination is minimized because of the lens/reflector bond and the seal at the base of the light source.

Ford stated that its replaceable bulb lamp was developed to assure a high reliability of positioning of the filament after repeated replacements of the bulb in different lamp bodies, and to ensure tight sealing of the capsule into the reflector. Ford asserted that it had rejected the European H-4 design with its multipiece stamped construction as unacceptably complex.

A single piece plastic molding is the foundation of Ford's new bulb design. Ford claimed that electrical socket molding technology has established that extremely fine dimensional control (±.004 inch) is consistently achievable even at elevated temperatures.

The Ford-type lamp has a bayonet mounting, selected because it provided positive "one way only" insertion of the bulb into the reflector assembly separate from the locking action of the retaining device. Twist lock designs currently used for signal lamp functions do not provide the precise and consistent filament positioning necessary for a headlamp assembly.

Control surfaces are established between the socket and mounting hole to provide (1) axial location, (2) surface to surface contact for in-out positioning of filament and (3) a controlled pin location for accurate filament position.

The method chosen for positioning and securing the bulb in the plastic molded base utilizes current technology such that either optical or dimensional filament control techniques are applicable. The bulb capsule can be inserted into a "master parabola" and illuminated, and the bulb can then be adjusted in the capsule using photo cells for optimum filament positioning. An alternative procedure would orient the filament relying strictly on dimensional location using an optical comparator.

Ford said in its petition that it believes a sealed, unvented assembly is desirable to avoid the problem of corrosion. The agency's primary concern about the headlamp systems in use in Europe has been corrosion developing on the inside and outside surfaces of lamp reflectors after a relatively short time in service. Painted steel reflectors were most commonly used in Europe, and the lamp assemblies were typically vented to the atmosphere through a controlled path. With the sealed capsule design, replacement of the bulb may be achieved in a manner which Ford thinks protects the optic surfaces within the lamp as would be the case in sealed beam units. Ford intends to fabricate the reflector from corrosion-resistant material.

A single silicone O-ring provides the seal for the bulb. Ford tests have allegedly shown that the pressure build-up inside the sealed headlamp cavity due to the operating temperatures of the lamp is approximately 20 psi. Due to the close tolerances of the mating parts and the use of a low durometer "O" ring seal which permits sealing across surface irregularities, an internal pressure of 100 psi can be contained within the lamp body. The efficacy of "O" ring seals to contain static pressure is well known.

Notice of Proposed Rulemaking

In the NPRM, NHTSA proposed three regulatory options that would allow for the use of new headlighting systems. Each of these systems would have involved the use of two separate components, the lens and reflector unit and a replaceable bulb unit. Options which were presented were—

(1) A Ford-type semisealed contoured lamp that has a standardized replaceable light source and that is designed to meet detailed photometric, dimensional and environmental performance requirements.

(2) A fully sealed lens reflector unit that could be contoured, that has a standardized replaceable light source, and that is required to meet standards similar to those in Option 1.

(3) A mechanically aimable unit that has a standardized replaceable light source and that is designed to meet minimum photometric requirements. The unit was not to be subject to detailed dimensional or environmental requirements as in the other options. The success of this option was to depend primarily on the product liability system and on use of the agency's defects authority to control unsatisfactory lamps.

Summary of Comments and Decision

NHTSA received extensive comments on the proposal from vehicle and lighting manufacturers and the general public. Most commenters favored the concept of new headlighting systems, although some commenters expressed no preference among the options. Those who commented on the options tended to favor Option 1, the subject of the Ford petition. Some commenters thought that option was too design restrictive, permitting a headlamp suitable only for one particular size of a two headlamp system and perhaps for only one manufacturer initially. The second choice was Option 3. However, both these options were also opposed by many commenters. Option 2, the sealed system with the replaceable bulb, occasioned few comments, but most of those were negative.

The agency has decided that Option 1 is the most feasible of the three proposed headlighting concepts and is adopting it with several modifications based on the comments. Since the Ford headlamp represents a new lighting technology, the agency believes that it is particularly appropriate to apply the detailed requirements of Option 1 to promote the lamp's safe performance.

With respect to Option 2, no specific proposals were presented to the agency for production of a contoured, sealed lens-reflector unit with a replaceable bulb. Also, while many of the motor vehicle equipment and vehicle manufacturers commenting on the NPRM favored Option 1, only one favored Option 2. Accordingly, the agency rejected Option 2.

The agency did not adopt Option 3 for several reasons. That option would require photometric conformance at the time the headlamp was manufactured and nothing more. No tests like those in Option 1 would be prescribed to ensure durability of the photometric performance over the life of the lamp. Assurance of continued performance would be provided almost solely by competitive forces of the marketplace, and NHTSA's defects authority. However, that authority is generally exercised only after safety problems have manifested themselves on the road. The agency believes that a higher quality of lamp is more likely to result if equipment is required to be built to certain specified levels of safety rather than left to the manufacturer's estimates of potential product liability and of the likelihood of the agency's discovery of defects and exercising its defects authority.

With the decision to adopt Option 1, the principal issue became the efficacy of the performance tests in ensuring that the headlamps will perform adequately in real world conditions. NHTSA believes that the tests as adopted would accomplish that goal.

Discussion of Comments

Designed to conform. Some commenters understood the proposal as requiring that the new headlamps conform with the applicable requirements instead of simply being designed to conform with those requirements. The commenters who addressed this issue uniformly urged that the latter approach be adopted as it already has been for all other items of lighting equipment under the standard. As the agency indicated in its recent amendment to Standard No. 108 to permit a new size of headlamps requested by Chrysler Corp., the agency will address this issue in a separate rulemaking proceeding.

Sequential testing of single lamp. Under NHTSA's proposal, a single lamp would have been tested sequentially under all of the standard's performance requirements. Most commenters did not favor sequential testing. Opponents objected to it on several grounds. From a practical standpoint, the time required for sequential testing of a single headlamp would be from 6 to 10 weeks. Further, laboratories would find it difficult to make efficient use of equipment since one facility must be held idle awaiting a lamp to finish another stop in the test. The agency notes that nonsequential testing would facilitate the agency's accurately judging a headlamp's level of performance under a particular environmental test. Failures could be more easily isolated and related to a particular test with nonsequential testing. For these reasons, NHTSA has decided to eliminate a requirement for sequential testing and to specify that a separate lamp be used for each test, except that the same lamp must be used for the temperature cycle and internal heat tests, for the reasons discussed below.

In addition to retaining certain sealed beam headlamp performance requirements, the amendment includes a series of environmental tests to assure adequate performance. The tests adopted are:

(1) Photometry.

(2) Abrasion.

(3) Vibration.

(4) Chemical Resistance.

(5) Corrosion.

(6) Dust.

(7) Temperature Cycle and Internal Heat.

(8) Humidity.

(9) Impact.

Photometry. A headlamp that has not been subjected to any of the environmental tests is required to meet certain SAE photometry requirements: S4.6 Photometry of SAE J575 "Test for Motor Vehicle Lighting Devices and Components," June 80; S3.1 Test Voltage and S3.5 Photometric Design Requirements, including Figure 3 and Table 1 of SAE J579c, December 78, SAE J580 "Sealed Beam Headlamp Assembly," August 77.

After a headlamp has been exposed to any of the following environmental hazards, abrasion, chemical resistance, humidity, dust, and temperature cycle/internal heat, it must continue to meet the photometric test prescribed by SAE Standard J579c. That test is currently a requirement of Standard No. 108 for existing headlamp systems.

Abrasion. Based on fleet field test results, the abrasion tests on plastic headlamps appear to be particularly critical. Accordingly, a proposed NHTSA procedure and an alternative Ford procedure were included to generate comment on this critical test phase. NHTSA proposed a test by which abrasion resistance would be judged by the effect of sand falling on a headlamp lens.

The abrasion test was to be required only if a proposed headlamp had a plastic lens. This was consistent with the agency's abrasion concerns, and with the current absence of any abrasion requirements applicable to existing glass surfaced lamp systems. At the end of the abrasion test, photometric output was to be measured to assure continuing compliance with SAE J579c, December 78.

Some commenters stated that the falling sand method of testing represents the manner in which abrasion actually occurs on headlamp lenses in use, and that the test has some "heritage" in an established ASTM procedure. However, opposing comments suggested that the reproducibility of a sand drop test is so poor that the results from different test laboratories could not be compared. NHTSA is concerned that a performance requirement based on that method of testing would not be readily enforceable.

Ford proposed a test in which steel wool would be rubbed against the lens for 11 cycles. It argued that the results of its test correlated more closely to the manner in which abrasion actually occurs than do the results of the falling sand test. Ford's data showed similar linear correlations between vehicle age and on-the-road development of headlamp haze due to abrasion and between the number of steel wool test cycles and the haze on headlamps tested under that test. There was no similarity in the correlation involving real world experience and that between the results of the falling sand test and the haze on headlamps resulting from that test. Most haze resulting from the falling sand test occurred during the first minute of testing.

Accordingly, the agency has adopted Ford's proposed test rubbing steel wool against the lens for 11 cycles, but not Ford's proposed abbreviated photometric checks following this test. Glass lensed units are exempt from the tests for abrasion and impact.

Vibration. At the conclusion of the proposed vibration test, there was not to be any evidence of loose or broken parts in the lamp, and the lamp was to continue to meet the photometric requirements. Since the proposed vibration test differed from the one currently specified in Standard No. 108 for other items of lighting equipment, the agency heeded requests not to have two different vibration tests requiring different test equipment. Therefore, the agency has amended the rule to specify the use of the vibration test specified by SAE J575e, the test currently applied to other items of lighting equipment. Similarly, as that vibration test allows filament fracture, the agency has determined that it is not appropriate to require photometric conformance following the vibration test.

Chemical resistance test. The proposed chemical resistance test involved total immersion of the entire test lamp in fluids for a period of five minutes, storage for 48 hours and then an examination for deterioration both in the lamp assembly and the photometric performance of the lamp. The proposed test fluids were gasoline, tar remover, motor oil, brake fluid, power steering fluid, windshield washer fluid, and antifreeze.

Most of those who commented on the chemical resistance test were opposed to the proposal that headlamps be totally immersed for a period of time in separate fluids. Opposition was based on the argument that this does not reflect actual conditions in service where a headlamp may come in contact with one of the listed fluids while being cleaned with a cloth having a variety of chemicals on it. Commenters also opposed use of gasoline and brake fluid as test fluids, the former primarily on the grounds of the effect likely upon a headlamp whose lens has already been subjected to the abrasion test, and the latter on the grounds that brake fluid, because of its corrosive nature, is not likely to be present on a cloth used in cleaning headlamps.

After due consideration of these comments, the agency has decided that total immersion of the lamp unit is not necessary since the purpose of the chemical resistance test is to ensure that the lens is not susceptible to damage by the listed fluids. Accordingly, the agency has modified the test to require that a headlamp be exposed to the fluids not by immersion, but by the more realistic procedures of being wiped with a cloth that has been immersed in one of the test fluids.

NHTSA has retained gasoline as a test fluid as it is a fluid very likely to be present on a wiping rag. The objection to using gasoline because of the headlamp's previous testing under the abrasion test is moot since the agency has deleted the provision for sequential testing of a single headlamp for compliance with all environmental tests. In view of the known corrosive effect of brake fluid on vehicle finishes, the agency believes that it is less likely that headlamps will be exposed to brake fluids than any of the other listed fluids. That effect and the warnings about brake fluid on containers of that fluid make it likely that mechanics will be particularly careful about not using brake fluid contaminated rags near any external vehicle surface. Therefore, the agency is not including it in the list of test fluids.

In concert with its elimination of sequential testing under the environmental tests, the agency is also eliminating the requirement that a single headlamp be exposed to each of the listed fluids. The agency believes that exposing a particular headlamp to only a single fluid will facilitate determining the performance capabilities of a headlamp when exposed to that fluid.

Corrosion test. The corrosion test that was proposed involved subjecting the test lamp to a salt spray test in accordance with ASTM B117-73 "Method of Salt Spray (Fog) Testing" for a period of 240 hours, consisting of ten successive 24-hour intervals. During each interval, the headlamp was to be exposed for 23 hours to the salt spray and then allowed to dry for an hour. At the end of the test period, compliance with the photometric requirements was to be determined. Further, the proposal provided that there could not be any evidence of internal or external corrosion more than an eighth of an inch from sharp edges, or any corrosion, on the terminals or elsewhere, which would involve loss of function.

Many commenters were concerned with the stringency of the test and the criteria. One commenter noted that the proposed test would not achieve the objective of ensuring reflectors with good corrosion resistance because the test does not take into account a situation in which a bulb may be removed for an extended period of time.

NHTSA is satisfied that the requirements are reasonable but believes that the test should be adjusted to reflect the possibility of bulb removal for an extended period of time or under highly humid conditions. Accordingly, the corrosion test adopted requires removal of the bulb for each one-hour period in which the salt spray is deactivated. This should introduce a salt atmosphere on the inside of the lamp. However, as this may create excessive salt deposits on the lens, not easily removed, there is no requirement to measure photometric requirements after the test period. The strictures against corrosion, of course, remain.

Dust test. There was general agreement on maintaining the dust test as proposed, in which fine powdered dust is diffused through a test box for a period of 5 hours. Accordingly, that test is adopted without change.

Temperature cycle, thermal shock, and internal heat tests. The principal changes made in the test procedures as adopted concern the temperature cycle, thermal shock, and internal heat tests. As proposed, a temperature cycle test was required from −40°F to 176°F for 10 complete cycles. The headlamp was not to show any evidence of specific adverse effects.

In the proposed thermal shock test, the headlamp was to be energized on its highest wattage filament for 45 minutes, then plunged into ice water (32°F) for five minutes. The headlamp was to be required to show no evidence of fractures, delamination or entry of water in liquid form after this test.

As proposed, the internal heat test provided that the lens was to be coated with simulated road dirt consisting of Zaccharini dust and water, to reduce light transmission to 25% of the original. No lens distortion was to be permitted at the end of such test.

The main issue associated with the related tests regarding temperature cycle, thermal shock and internal heat is the relationship between the tests and the expected performance under actual operating conditions. Two basic aspects of performance are addressed by these tests. One is the integrity of the construction of the lamp. This is typically tested by cycling a lamp between a hot and a cold temperature. The second aspect is the permanence of the shape and size of the lens, reflector, and filament under high temperature conditions. Any changes in this geometry should be noticeable from the lens distortion measurements and photometric tests conducted after exposure to such conditions.

As for the first aspect, most commenters who addressed the temperature range in the temperature cycle test indicated that the integrity of lamp construction can be tested adequately with a smaller temperature cycle range than the −40°F to +176°F range that was proposed. Accordingly, the agency adopted a narrower range of −30°F to

+120°F. As for the second aspect, a minimal amount of lens warpage, .118 inch, is allowed in the final rule since it is not practicable to insist that plastic lenses remain absolutely warpage free. That small amount of distortion should not pose any safety problem since the lamp must still meet photometric conformance requirements. Finally, in a change from the proposal, the rule allows any means including Zaccharini dust to reduce light transmittance to 25±2% of the output originally measured.

Headlamps will still be subjected to sufficiently high temperatures to ensure adequate performance. NHTSA understands that plastic materials currently used in headlamps can begin to lose strength in high ambient temperatures when the lens is very dirty. The internal heat test will, it is believed, generate temperatures seen in this condition.

The agency has decided to delete the proposed thermal shock test. That test is redundant, particularly because the agency has decided also that the temperature cycle and internal heat tests should be linked so as to require a single headlamp to demonstrate compliance with both of them. The temperature cycle test will not only test headlamps at extreme temperatures likely to be encountered in the real world, but also to subject them to a substantial change in temperature in a several hour period. Even with the narrower range adopted in this notice, headlamps will be required to maintain their performance when subjected to a much greater temperature change than headlamps will experience in the real world.

Humidity test. For the humidity test, the agency proposed that the headlamp was to be operated in a controlled environment of 100°F and humidity from 80 to 100% and was not to show any evidence of moisture, fogging, or delamination, after a period of 240 hours during which the headlamp is turned on and off. Although some commenters believed that some moisture should be allowed as a result of the test, NHTSA has decided that headlamps should be constructed so that no moisture can collect. However, the agency believes that a lesser period of time is sufficient to demonstrate compliance and the humidity test has been adopted with a period of 120 hours.

Impact test. The agency proposed an impact test which would require a plastic lens to withstand a single impact by a steel ball bearing 1.76 oz. (50 grams) in weight and dropped from a distance of 15.75 inches (40 cm.) above the lens. This test has been adopted as proposed.

Out-of-focus and bulb deflection tests. Two tests, an out-of-focus test and a bulb deflection test, were proposed to ensure the proper placement of the bulb filament. The out-of-focus test, not part of the Ford petition, was similar to that currently required of motorcycle headlamps which incorporate a replaceable bulb. The bulb deflection test was proposed by both NHTSA and Ford to simulate the effect of rough handling which could affect the bulb filament alignment, such as might occur during insertion of a replacement bulb. The agency believes that it is redundant to have two tests to ensure proper filament placement. That placement is a function of bulb fit and filament position. The latter is assured by the narrow tolerances in the required bulb specifications and the former by the bulb deflection test. Accordingly, the agency has decided not to adopt an out-of-focus test.

Provision of bulb with new vehicle. NHTSA also proposed that manufacturers be required to provide a replacement bulb with every vehicle equipped with the new headlighting system. Several commenters opposed this requirement as unnecessary. This proposal is adopted but restricted to those motor vehicles manufactured during the first year in which the new amendments are effective. The establishment of that fixed period is premised on introduction of the new Ford-type headlamps near the beginning of that period. Based on that premise, the agency anticipates that replacement bulbs should be readily available through normal distribution channels at the end of the one year period. If the agency's premise proves false or distribution problems otherwise arise, the agency will consider extending this period.

Testing of replacement headlamps. Each lens-reflector unit manufactured as replacement equipment would also have to meet the performance requirements of replaceable bulb headlamps when a standardized replaceable light source is inserted. This requirement is adopted as proposed.

Adapter for aiming device. Because most existing mechanical aimers are not designed for headlamps with contoured lenses, the agency proposed to require that an adapter to facilitate aiming be furnished with each vehicle manufactured during the first model year in which replaceable bulb headlamps are included as standard equipment. The adapter specified has been designed by Ford for this purpose. After that time, an adjustable adapter, also designed by Ford, should be available for mechanical aimers such that all contoured lenses could be aimed by reference to the pad aiming dimensions. Some commenters argued that the agency should not require mechanical aiming and thus should not adopt the requirement concerning adapters. The agency believes that requiring mechanical aiming is appropriate since most aimers used in this country are mechanical. The adapter requirement has been adopted for motor vehicles manufactured between July 1, 1983, and June 30, 1984, and equipped with the new headlamps. As in the case of the period established for provision of a replacement bulb with new vehicles, the agency will monitor the production of headlamps under the option adopted by this notice and consider making any necessary adjustments in the end date of the period.

Distortion of plastic lenses. Because Ford intends to construct its lamps of plastic, lens distortion appeared to be another important issue. Elevated headlamp operating temperatures caused by dirt on the lens could exceed the thermal limit of some plastics and result in distortion. NHTSA's proposal and amendment distinguish between lamps of plastic and glass, not prohibiting use of the one or requiring the other. However, a headlamp using plastics would have to be certified as meeting the currently required tests for plastics of SAE J576c, including a heat test and the 3-year outdoor exposure test (now most generally conducted as a simulated equivalent).

Other issues. Two additional issues of major concern to a number of commenters were the suggestion that Option 1 was excessively design restrictive and the belief that greater consideration needed to be given to the use of the H4 bulb in the interest of international harmonization.

Standard No. 108 already contains many provisions substantially affecting design because of the necessity to standardize lighting equipment for the purpose of ensuring the ready availability of replacement lights. In recognition of the complexity of the proposed design dimensions of the standardized replacement light source, NHTSA has eliminated some of the proposed specifications. In order to allow manufacturers complete freedom in the exterior design of the lamp, however, the light source must be standardized to avoid proliferation. The H4 bulb was not included in the NPRM because NHTSA concluded that the bulb presented in the Ford petition was superior in design. The close fit of the bulb capsule and reflector socket (to prevent misaim from an out-of-position filament) and the O-ring seal were especially important in the agency's view. While the final rule does not harmonize light source, it will produce cost savings by allowing manufacturers to employ the same front end sheet metal for all markets.

One manufacturer expressed concern that NHTSA's allowance of the Option 1 system would mean that the agency would not consider petitions for the adoption of additional headlighting systems. The agency does not agree that new lighting concepts will be foreclosed from consideration. Each new concept will be judged on its merits.

Impact Analyses

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291, "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, as its adoption does not require any person to change current practices under the standard. A regulatory evaluation has been prepared and placed in the docket. (A free copy of this document can be obtained from the Docket Section.) The rule will not impose any additional requirements but will permit manufacturers greater flexibility in the design of headlighting systems and adjacent exterior vehicle surfaces. Use of this flexibility will allow improvements in safety, aerodynamic efficiency and fuel economy. The extent of such improvement is dependent on the extent to which manufacturers take advantage of the new headlamp designs permitted by the option.

Safety benefits. The agency has determined that use of the replacement bulb headlamp has the potential to provide several safety benefits as well as increase fuel economy through reducing aerodynamic drag and vehicle weight. One such potential benefit is that the aerodynamic shape of the lens may aid in keeping the lens cleaner and thus the light output higher. Further, the easy replacement of the bulb may result in faster replacement of burned out headlamps.

Energy saving benefits. Based on testing by Ford, it appears that use of the replaceable bulb headlamp would make possible a 2 percent reduction in aerodynamic drag. The slight weight reduction that could be achieved through use of plastics and the reduced aerodynamic drag would produce an average savings of 26 gallons over the life of a vehicle. Together, these quantifiable benefits could provide savings of $4.00 per vehicle per year.

Costs. The safety benefits could, of course, be offset if in those instances in which fractures do occur, the economic costs of replacement were prohibitive. Concerns regarding this possibility were raised by some commenters. However, the agency's analysis does not indicate that the replacement costs would be prohibitive. The average installed cost for replacing today's halogen sealed beam unit is approximately $20. The same figure for a replaceable bulb lamp complete with bulb would be about $55 according to information provided by Ford. Corning, however, estimates that the cost could be as high as $80.

The agency estimates that the initial consumer cost is $19 per car or $2 per year. The average annual incremental replacement cost to the vehicle owner is believed to range between $1 and $3 per lamp depending on the amount of stone damage experienced by the lamp. Therefore, the incremental annual consumer cost is believed to range from a cost of $3 to $5 per car per year. Considering the benefit of $4, the net consumer cost is estimated to range from a saving of $1 to a cost of $1 per car per year.

NHTSA has concluded that this rule will not have a significant impact on the human environment. The lamps that will be manufactured pursuant to the rule are expected to be lighter, thus slightly reducing the overall material content of the automobile. This would have a small positive effect on the environment. No adverse impact on safety is anticipated, although as noted above the greater resistance of plastic facing to fracture in on-road use could produce incremental safety benefits by reducing the number of occasions in which fractures result in loss of illumination.

The agency has also considered the impacts of this rule under the Regulatory Flexibility Act. I certify that this rule will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles and headlamps, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Further, these manufacturers would be affected only to the extent that they elected to take advantage of the new headlighting option that is established by the rule. The number of different components in the inventories of headlamp distributors will increase, but not to the extent that any significant problem will be created. Finally, small organizations and governmental jurisdictions would be affected only to the extent that they choose to buy vehicles equipped with the new headlamps. The organizations and jurisdictions making that choice would not be significantly affected by the price of the new headlamps.

Because motor vehicle manufacturers must make timely decisions with respect to product plans for the 1984-model year, it is hereby found that an effective date earlier than 180 days after issuance of the rule is in the public interest. The rule is effective July 1, 1983.

PART 571—[AMENDED]

§ 571.108 [Amended]

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

1. Section S3 Definitions is amended by adding the following definitions so that all definitions in that section are in alphabetical order:

"Headlamp test fixture" means a device designed to support a replaceable bulb headlamp in the test position specified in the laboratory tests in S4.1.1.36(d), and whose mounting hardware and components are those necessary to operate the headlamp as installed in a motor vehicle.

"Replaceable bulb headlamp" means a headlamp comprising a bonded lens and reflector assembly, and a standardized replaceable light source.

"Seasoning" means a process of energizing the filament of a headlamp, at design voltage, for a period of time equal to 1 percent of average rated laboratory life.

"Standardized replaceable light source" means an assembly of a headlamp bulb, base, and terminals, as described in Figure 1.

2. New Sections S4.1.1.36, S4.1.1.37, S4.1.1.38, S4.1.1.39 and S4.1.1.40 are added to read as follows:

S4.1.1.36. Instead of being equipped with a headlighting system specified in Table I or Table III, a passenger car, multipurpose passenger vehicle, truck, or bus manufactured on or after July 1, 1983, may be equipped with two replaceable bulb headlamps which are designed to conform to the following requirements:

(a) (1) Each replaceable bulb headlamp shall include components which are designed to conform to the applicable specifications of paragraph S4.1.1.38 and Figure 3—*Specifications For The Standardized Replaceable Light Source,* including filament location, base and socket dimensions, electrical connector dimensions, and maximum design wattage.

(2) The exterior face of each replaceable bulb headlamp lens shall have three pads which meet the requirements of Figure 4, *Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units,* and which form an aiming plane for mechanically adjusting and inspecting headlamp aim. The exterior lens face shall have molded into it the specific settings applicable to that headlamp as designed to be installed in the vehicle, for each of the two adjustable legs of the aiming device locating plate; e.g., "11H 17V" requires the horizontal aiming pad leg to be set in position 11, and the vertical aiming pad leg to be set in position 17.

(b) Each replaceable bulb headlamp shall meet the following sections of the specified SAE Standards and Recommended Practices:

(1) Section 4.6—Photometry of SAE J575 "Tests for Motor Vehicle Lighting Devices and Components" June 80.

(2) Section 3.1—Test Voltage, and Section 3.5—Photometric Design Requirements including Figure 3 and Table 1 of SAE J579c "Sealed Beam Headlamp Units for Motor Vehicles" December 1978, except that the aiming plane on the lens shall be at horizontal and vertical distances to the photometer axis as inscribed on the lens of a replaceable bulb headlamp.

(3) Section 5—General Requirements, Section 6—Design Requirements and Tests (to the extent listed below), Section 6.1—Aiming Adjustment Test, Section 6.2—Inward Force Test, and Section 6.4—Connector Tests of SAE J580 "Sealed Beam Headlamp Assembly" August 1979.

(c) A headlamp with a glass lens need not meet the abrasion resistance test specified in S6.2, nor the impact test specified in S6.11.

(d) When tested according to any of the procedures indicated in subparagraphs (1) through (8), a replaceable bulb headlamp shall meet the appropriate requirement:

(1) After an abrasion test conducted in accordance with S6.2, the headlamp shall meet the photometric requirements of SAE J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978.

(2) After a vibration test conducted in accordance with S6.3, there shall be no evidence of loose or broken parts visible without magnification, except that the filament need not be unbroken.

(3) After a chemical resistance test involving exposure to any of the fluids listed in S6.4, there shall be no surface deterioration, coating delamination, fractures, deterioration of bonding materials, color bleeding or color pick-up visible without magnification, and the headlamp shall meet the photometric requirements of SAE J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978.

(4) After a corrosion test conducted in accordance with S6.5, there shall be no evidence of external or internal corrosion or rust visible without magnification. Loss of adhesion of any applied coating shall not occur more than .125 inch (3.2 mm) from any sharp edge on the inside or outside. Corrosion may occur on terminals provided there is no voltage drop greater than 3 percent from that measured before the test when measured per paragraph 6.4 of SAE J580 August 1979.

(5) After a dust test conducted in accordance with S6.6, the headlamp shall meet the photometric requirements of SAE J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978.

(6) The headlamp shall first meet the requirements of paragraph (d) (6) (A) and then those of paragraph (d) (6) (B).

(A) After a temperature cycle test conducted in accordance with S6.7.1, the headlamp shall show no evidence of delamination, fractures, entry of moisture or deterioration of bonding material, color bleeding, warpage or deformation visible without magnification, or lens warpage greater than .118 inch (3 mm) when measured perpendicular to the aiming plane at the point of intersection of the mechanical axis with the exterior surface of the lens, and it shall meet the photometric requirements of SAE J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978.

(B) After an internal heat test conducted in accordance with S6.7.2, there shall be no lens warpage greater than .118 inch (3 mm) when measured perpendicular to the aiming plane at the point of intersection of the mechanical axis with the exterior surface of the lens, and it shall meet the photometric requirements of SAE J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978.

(7) After a humidity test conducted in accordance with S6.8, the inside of the headlamp shall show no evidence of delamination or moisture, fogging or condensation visible without magnification, and the headlamp shall meet the photometric requirements of SAE J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978.

(8) After an impact test on a headlamp with a plastic lens conducted in accordance with S6.11, there shall not be any fracture of the adhesion of lens coating or delamination of materials visible without magnification, and the lens shall not be broken, cracked, or chipped.

S4.1.1.37 Each lens-reflector unit manufactured as replacement equipment for a replaceable bulb headlamp system shall conform to the requirements of S4.1.1.36 when a standardized replaceable light source is inserted in it.

S4.1.1.38 Each standardized replaceable light source shall conform to the following requirements:

(a) A silicone O-ring shall be provided.

(b) The bulb portion of the standardized replaceable light source shall meet the requirements in paragraph (b) (1) through (b) (6) of this section.

(1) The general specifications of the bulb shall be:

	Low Beam	*High Beam*
Watts @ 12.8 V	45	65
Lumens (without black cap) @ 12.8 V	1067 ± 7½%	1736 ± 7½%
Average Life @ 14.0 V	320 Hrs.	150 Hrs.

(2) The bulb filaments shall be subject to seasoning prior to wattage and lumens measurement.

(3) Wattage and lumens measurements shall be made with the direct current test voltage regulated within one quarter of one percent.

(4) Except for reference dimensions, and unless otherwise specified, a general tolerance of ±.004 in. (0.10 mm) shall apply to all linear dimensions and ±1°.00′ shall apply to all angular dimensions.

(5) Bulb, lead wires and/or terminals shall be installed in the base so as to provide an airtight seal.

(6) After a bulb deflection test conducted in accordance with S7, the permanent deflection of the glass envelope of each standardized replaceable light source shall not exceed .005 inch (.13 mm) in the direction of the applied force in the base.

S4.1.1.39 Each motor vehicle manufactured on or after July 1, 1983, and before July 1, 1984, which is equipped with a replaceable bulb headlamp system shall also be provided with a spare standardized replaceable light source as original equipment for such vehicle.

S4.1.1.40 The lens of each replaceable bulb headlamp that conforms with this standard, and the side of the base of each standardized replaceable light source shall be marked with the symbol "DOT" or "D O T" which shall constitute a certification that the headlamp or light source conforms to all applicable Federal motor vehicle safety standards.

3. New sections S6, S7, and S8 are added to read:

S6. *Tests and procedures for replaceable bulb headlamps.* When tested according to the procedures below, each replaceable bulb headlamp shall meet the requirements of S4.1.1.36(b) and (d).

S6.1 *Photometry.* A headlamp shall be tested according to Section S3.5, Photometric Design Requirements of SAE Standard J579c, "Sealed Beam Headlamp Units for Motor Vehicles" December 1978, after the tests specified in S6.2, S6.4, S6.6, S6.7(a), S6.7(b) and S6.8.

S6.2 *Abrasion.* (a) A headlamp shall be mounted in the abrasion test fixture in the manner indicated in Figure 5 with the lens facing upward.

(b) An abrading pad meeting the requirements in paragraph (c)(1) through (c)(4) of this section shall be cycled back and forth (1 cycle) for 11 cycles at 4 ±0.8 in. (10 cm ±2 cm) per second over at least 80 percent of the lens surface, including all the area between the upper and lower aiming pads, but not including lens covers and edges.

(c)(1) The abrading pad shall be not less than 1.0 ±.04 in. (2.5 cm ±.1 cm) wide, constructed of 0000 steel wool, and rubber cemented to a rigid base shaped to the same vertical contour of the lens. The "grain" of the pad shall be perpendicular to the direction of motion.

(2) The abrading pad support shall be equal in size to the pad and the center of the support surface shall be within ±.08 in. (±2 mm) of the lens surface.

(3) The density of the abrading pad shall be such that when the pad is mounted to its support and is resting unweighted on the lens, the base of the pad shall be no closer than .125 in. (3.2 mm) to the lens at its closest point.

(4) When mounted on its support and resting on the lens of the test headlamp, the abrading pad shall then be weighted such that a pad pressure of 2.0 ±.15 psi (14 ±1 KPa) exists at the center and perpendicular to the face of the lens.

(d) A pivot shall be used if it is required to follow the contour of the lens.

(e) Unused steel wool shall be used for each test.

S6.3 *Vibration.* A vibration test shall be conducted according to the procedures in SAE Standard J575e, "Tests for Motor Vehicle Lighting Devices and Components" August 1970, and those set forth in paragraphs (a) through (c) of this section.

(a) The table on the adapter plate is of sufficient size to contain completely the test fixture base with no overhang.

(b) The direction of vibration is the vertical axis of the headlamp as mounted on the vehicle.

(c) The filament is cold (not energized).

S6.4 *Chemical resistance.* (a) The entire exterior lens surface of the fixtured headlamp and top surface of the lens-reflector joint shall be wiped once to the left and once to the right with a 6-inch square soft cotton cloth (with pressure equally applied) which has been saturated once in a container with 2 ounces of one of the test fluids listed in paragraph (b) of this section. The lamp shall be wiped within 5 seconds after removal of the cloth from the test fluid.

(b) The test fluids are:

(1) gasoline—unleaded 89 octane $\frac{(R+M)}{2}$ or above used per OSHA Std. 29 CFR 1910-106—Handling Storage and Use of Flammable Combustible Liquids.

(2) tar remover (petroleum base with Xylene).

(3) power steering fluid.

(4) windshield washer fluid consisting of 1.5% monethinalamine with the remainder 50% concentrations of methanol/distilled water by volume.

(5) antifreeze (50% concentration of ethylene glycol/distilled water by volume).

(c) After the headlamp has been wiped with the test fluid, it shall be stored in designed operating attitude for 48-hours at a temperature of 73°F ±7° (23°C ±4°) and a relative humidity of 30 ±10 percent. At the end of the 48-hour period, the headlamp shall be wiped clean with a soft dry cotton cloth and visually inspected.

S6.5 *Corrosion.* The headlamp, unfixtured and in its designed operating attitude with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be subjected to a salt spray (fog) test in accordance with ASTM B117-73, "Method of Salt Spray (FOG) Testing," for a period of 240 hours, consisting of ten successive 24-hour intervals. During each interval, the headlamp shall be exposed for 23 hours to the salt spray, which shall not be activated for the 24th hour. The bulb shall be removed during the one hour of salt spray deactivation and reinserted for the start of the next test cycle.

S6.6 *Dust.* The headlamp, mounted on a test fixture, with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be positioned within a cubical box, with inside measurements of 35.4 in. (900 mm) on each side or larger if required for adequate wall clearance, i.e., a distance of at least 5.9 in. (150 mm) between the headlamp and any wall of the box. The box shall contain 9.9 lb. (4.5 kg) of fine powdered cement which conforms to the ASTM C150-77 specification for Portland Cement. Every 15 minutes, the cement shall be agitated by compressed air or fan blower(s) by projecting blasts of air for a two-second period in a downward direction so that the cement is diffused as uniformly as possible throughout the entire box. This test shall be continued for five hours after which the exterior surfaces of the headlamp shall be wiped clean.

S6.7 *Temperature and internal heat tests.*

S6.7.1 *Temperature cycle.* A headlamp, mounted on a headlamp test fixture, shall be exposed to 10 complete consecutive thermal cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the highest wattage filament in the headlamp shall be energized at design voltage commencing at point "A" of Figure 6 and de-energized at Point "B." Separate or single test chambers may be used to generate the temperature environment described by the thermal cycle profile. All drain holes, breathing devices or other designed openings of the headlamp shall be in their normal operating positions.

S6.7.2 *Internal heat.*

(a) After its lens surface has been cleaned, the photometric output on upper beam of a headlamp that has been tested according to S6.7.1 is measured.

(b) The lens surface of the headlamp that would normally be exposed to road dirt shall be sprayed uniformly with any appropriate mixture of dust and water or other material to reduce the photometric output at the test point H-V of the lamp to 25% ±2% of the output originally measured in the high beam photometric test under paragraph (b) of S4.1.1.36. Such reduction shall be determined under the same conditions under which the original measurement was made.

(c) After the determination has been made that the photometric output of the lamp has been reduced as specified in S6.7.2, the lamp and its mounting hardware shall be mounted in an environmental test chamber in the manner similar to that indicated in Figure 7 "Dirt-Ambient Test Setup." The headlamp shall be soaked for one hour at a temperature of 95°F (35°C) and then be energized for one hour in a still air condition, allowing the temperature to rise from 95°F (35°C).

(d) The lamp shall be returned to the room ambient temperature, 73 ±7°F (23 ±4°C) and relative humidity of 30 ±10%. The lens shall then be cleaned. Photometric output of the lamp on high beam shall be determined according to S6.1.

S6.8 *Humidity.* (a) The headlamp, mounted on a test fixture, shall be placed in a controlled environment consisting of a temperature of 100°F ±9° (38°C ±5°) with a relative humidity of 90% ±10%. All drain holes, breathing devices, and other designed openings shall be in their normal operating positions. The headlamp shall be subjected to 20 consecutive 6-hour test cycles. In each cycle, it shall be energized at design voltage on the highest wattage filament contained in the device for 1 hour and then de-energized for 5 hours. After completion of the last cycle, the lamp shall be soaked for 1 hour at 73°F (20°C) and a relative humidity of 30% ±10% before it is removed for photometric testing. The headlamp shall be tested for photometrics at 10 ±1 minutes following completion of the humidity test.

S6.9 *Impact.* The headlamp shall be rigidly mounted in a headlamp test fixture on the seating lugs with the mechanical axis (bulb socket axis) vertical, and the lens upward. The seating plane of the test fixture shall consist of oakwood 0.5 inch (13 mm) thick. One impact shall be delivered to the center of the lens on the mechanical axis using a steel ball bearing with a diameter of .9055 in. (23 mm) weighing 1.76 oz. (50 grams), dropped freely from a distance of 15.75 in. (40 cm) from the bottom of the ball to the surface of the lens, at the intersection of the ball trajectory and the mechanical axis of the headlamp.

S7. *Deflection test for replaceable bulb.* Each replaceable bulb shall meet the requirements of S4.1.1.38(b) (6) when tested in the following manner. With the bulb rigidly mounted in a fixture in a manner indicated in Figure 8, apply a force of 4.0±0.1 lb. (17.8±4N) perpendicular to the longitudinal axis of the glass envelope and perpendicular to, and in a line intersecting, the lateral axis of the low beam filament. The force shall be applied to the outside surface of the glass envelope using a rod with a hard rubber tip with a minimum spherical radius of .039 in. (1 mm).

S8. *Aiming device locating plate for replaceable bulb headlamps.* Each motor vehicle manufactured on or after July 1, 1983, and before July 1, 1984, which is equipped with a replaceable bulb headlamp system shall be furnished with a Headlamp Aiming Device Locating Plate, conforming to:

(a) The general requirements of SAE J602, October 1980 "Headlamp Aiming Device for Mechanically Aimable Sealed Beam Headlamp Units," and Figure 9, except that the general and specific references in that standard to sealed beam headlamp units shall be read as applicable to replaceable bulb headlamps, and references in that standard to dimensions for headlamp aiming device locating plates shall be read in reference to the dimensions specified in this section.

(b) (1) If a suction cup is used to retain a mechanical aiming device to the headlamp unit, the overall diameter of the suction cup shall not exceed 2.8 in. (71 mm). The suction cup assembly shall be capable of securing the aiming device to a smooth lens surface angled up to 30 degrees universally from a transverse plane perpendicular to the H-V axis of the lamp.

(2) The aiming pad seating surface on the locating plate shall be free of burrs, projections, holes or impressions.

(3) There shall be no projections, tangs, or lugs on the locating plate that would prevent the seating surfaces locating with the aiming pads on the headlamp lens surface.

(4) Each of the two adjustable legs shall be capable of being extended, and locked in position, in increments of .10 in. (2.54 mm) with each increment measured from the 'O' seating plane (perpendicular to the H-V axis of the lamp) with a maximum tolerance of ±.01 in. (±0.25 mm). The incremental positions extending out from the 'O' seating plane shall be identified by whole numbers, i.e., 'O', '1', '2', '3', through a minimum of '37' for the vertical adjustable leg and a minimum of '20' for the horizontal adjustable leg.

4. New Figures 3 through 9 also are added.

Issued on May 20, 1983.

Raymond A. Peck, Jr.
Administrator

48 F.R. 24690
June 2, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices and Associated Equipment

[Docket No. 81-11; Notice 4]

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: This notice responds to petitions for reconsideration of the June 2, 1983 notice (48 FR 24690) amending Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to allow use of a semi-sealed replaceable bulb headlamp system. Corrections are also made to errors appearing in the June notice.

In response to a petition from Ford Motor Company, the requirement that an adjustable aimer adapter be supplied with vehicles equipped with the semi-sealed headlamp system is modified to specify that the aimer adapter be a fixed type. The agency acknowledges that some time is required to modify the suction cup mount on existing mechanical aimers to allow use of the adjustable aimer adapter. The requirement to assure performance on the headlamp connectors after the corrosion test is revised to eliminate an overly stringent requirement, in response to petitions from both Ford and Volkswagen. The requirement reverts to no loss of function as proposed originally. In addition, critical dimensional changes were made to the drawings on the replaceable light source. Also, in response to petitions from Volkswagen and Westfalische Metall Industries, the corrosion test for semi-sealed headlamps is amended to delete the requirement for testing with the bulb removed, and to adopt the test proposed on January 17, 1983 (48 FR 1992). The effect of all these changes is to allow manufacturers to commence manufacturing the new headlamps for their introduction before the end of the year.

Finally, the agency has deleted all dimensions of the standardized replaceable light source that were originally specified only for reference purposes.

EFFECTIVE DATE: September 30, 1983.

SUPPLEMENTARY INFORMATION: On June 2, 1983, NHTSA published a notice amending 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* (48 FR 24690). The amendment adopted an optional motor vehicle headlighting system consisting of two semi-sealed replaceable bulb headlamps. Each headlamp consists of two discrete components, a lens bonded to a reflector, and a replaceable light source of standardized design. To insure the proper performance of the new headlamp design, certain environmental tests were adopted. Petitions for reconsideration of various aspects of the amendment were filed by Ford Motor Company ("Ford"), General Motors Corporation ("GM"), Sylvania, Volkswagen of America ("VW"), and Westfalische Metall Industries (manufacturer of Hella lighting equipment) ("Hella"). Because the headlamps may incorporate inclined lenses and most existing mechanical aimers are designed for headlamps with vertical lenses, the amendment required that each vehicle manufactured between July 1, 1983, and July 1, 1984, which has the new headlamps system, be furnished with an adjustable adapter to allow use of existing mechanical aiming equipment.

Discussion of Petitions

Corrosion Test (Paragraphs S4.1.1.36(d)(4) and S6.5).

In its notice of proposed rulemaking on January 17, 1983, (48 FR 1992) NHTSA proposed a corrosion test which would involve subjection of a test lamp to a salt spray test in accordance with ASTM B117-73 "Method of Salt Spray (Fog) Testing" for a period of 240 hours, consisting of ten successive 24-hour intervals. During each 24-hour interval, the test chamber salt spray would be activated for 23 hours and deactivated for 1 hour. At the end of the test period, there could not be evidence of internal or external corrosion more than an eighth of an inch from sharp edge or any corrosion on the terminals or elsewhere, which would involve loss of function. Further, the lamp would be required to meet the minimum photometric requirements for headlamps at the end of the test.

As NHTSA stated in its June 2, 1983 notice, "One commenter noted that the proposed test would not achieve the objective of ensuring reflectors with good corrosion resistance because the test does not take into account a situation in which a bulb may be removed for an extended period of time." NHTSA adopted a corrosion test requiring removal of the bulb for the 1 hour of the interval in which the salt spray is deactivated to assure adequate corrosion resistance of reflector surfaces with an accelerated test. In recognition of the fact that the introduction of a salt atmosphere on the inside of the lamp might create a salt deposit on the lens not easily removed, the proposal for photometric performance at the end of the test was not adopted. The strictures against rust or corrosion on the lens and reflector were adopted as proposed. In summary, in adopting the corrosion test NHTSA believed that lens-reflector assemblies needed a corrosion requirement to prevent premature reflector degradation in cheaper parts which might become available.

NHTSA was petitioned by VW and Hella to reconsider the modified corrosion test. VW's objection, and the principal objection by Hella, was the requirement that the bulb be removed during the final hour of each of the ten test cycles. Both petitioners object on the grounds that the test was not discussed in the proposal. In VW's opinion, only an all-plastic lamp could meet the new corrosion requirements and it does not believe that the agency intended to be design restrictive. It therefore petitioned that the standard be amended to adopt the corrosion test as proposed. It was Hella's position that the requirements do not mirror real-world conditions and afford the opportunity of water entry during bulb removal or insertion which could bias the test results.

The agency has considered these comments carefully. Although the test it proposed appeared adequate at the time to judge the performance of a semi-sealed lamp as a whole, the agency adopted a more component-oriented test to ensure adequate reflector performance with an accelerated test. It is evident, however, that at least some commenters believe the subject of corrosion testing should be more fully explored. Because the replacement market for the new headlamps will be minimal during the first year of the lamps' availability, NHTSA is granting the petitions of VW and Hella for reconsideration of the subject, and amending the standard to specify the corrosion test without bulb removal as proposed. NHTSA is preparing a notice of proposed rulemaking which will propose a bulb removal test for lamps. This NPRM will appear in the near future.

In addition, the agency originally proposed a prohibition against "loss of function" on lamp terminals. This was quantified in the final rule to allow corrosion on terminals "provided there is no voltage drop greater than 3 percent from that measured before the test when measured per paragraph 6.4 of SAE J580 August 1979."

Ford raised a question as to the appropriateness of the electrical test. VW also objected to the adoption of the 3 percent voltage drop, on the basis that it had not been described in the proposal, and that it was unreasonable. The reason for the objection is that the terminals are similar to those of sealed beam lamps and renewed at each burnout. In VW's opinion, no significant safety problem has occurred, and if some limit on corrosion of the terminals is necessary, the "loss of function" requirement should be sufficient.

NHTSA agrees that the requirements in the *Federal Register* should be reconsidered and is amending the standard to specify the requirement as proposed. The agency is preparing an NPRM which will propose a new test. This NPRM will appear in the near future.

Accurate Rated Bulb. In its comments on the proposal, GM stated its assumption that NHTSA would use "accurate rated bulbs" in its compliance testing of the new headlamps. In its petition for reconsideration it asked that the photometry specified in paragraph S4.1.1.36(b)(1) be conducted according to paragraph S4.1.1.20 of Standard No. 108 as well as the already-specified paragraph 6.4 of SAE J575 June 80. Paragraph S4.1.1.20 states: "Except for a lamp having a sealed-in bulb, a lamp *** shall meet the applicable requirements of the standard when tested with a bulb whose filament is positioned within ±.010 inch of the nominal design position specified in SAE Standard J573d, "Lamp Bulbs and Sealed Units," December 1968, or specified by the bulb manufacturer." GM argues that use of such bulbs provides a common basis for evaluating other components, and that in this manner compliance testing on lighting devices made by other laboratories can be repeated and compared.

The bulbs specified in J573d and defined as "accurate rated" have the trade numbers 1156, 1157, and 1157A, and are intended for applications other than headlamps. Sealed beam headlamps are tested "as is" without reference to filament tolerance and must meet the minimum photometric requirements regardless of filament placement. NHTSA believes that this concept has met the need for headlamp safety and that there is no need to prescribe a filament tolerance of ±.010 for the standardized replaceable light source. The tolerance specified on low beam is ±.015 inch with the centerline of the high beam to be located within ±.035 inch of the centerline of the low beam. The semi-sealed headlamp with replaceable light source should be tested photometrically in a manner identical to its fully sealed counterparts. GM's petition is denied.

Replaceable Light Source Dimensions. GM commented that the specifications of the filament are not sufficiently rigorous to define the exact placement of the filament within the bulb assembly, which could present a problem because the headlamp manufacturer may have to certify a lamp using aftermarket bulbs. It requested additional specifications on rotation, slant and snake of the filament, and it also stated that the tolerance of Dimension G in Figure 3-5 (sic) was in error.

The agency is amending the dimensions of Figure 3-6. But GM's petition to adopt additional dimensions is denied; in the agency's view, a minimum standard does not require the additional dimensions suggested. Any vehicle manufacturer, however, may specify that its supplier provide bulbs meeting additional specifications if it wishes.

Sylvania and Ford pointed out various errors and minor changes needed in Figure 3 which specifies dimensions for the standardized replaceable light source. (Sylvania stated that a more accurate way to describe the cap was needed.) The petitions are granted on these points and all the requested changes are being made.

Change in Definition. GM petitioned that the word "bonded" be removed from the definition of replaceable bulb headlamp so that a lens alone could be replaced in the event of breakage. In the development of the final rule, NHTSA considered changing the definition in the manner requested but rejected it because removable lenses introduce additional opportunities for aiming problems due to alignment inaccuracy. Also, there is the opportunity for substitution of lenses designed for off-road vehicles and for other than U.S. beam patterns. Accordingly, GM's petition is denied.

Vibration Test. NHTSA proposed a vibration test with many of the characteristics of that contained in SAE J575 June 80. There were very few comments on the proposal, but it was pointed out that the test differed from that of SAE J575e, already incorporated in Standard No. 108 for headlamps and other lighting devices. Accordingly, the final rule adopted the vibration test currently required for other items of lighting equipment, so as not to burden manufacturers with differing vibration tests requiring different test equipment.

Commenting that this is a "substantive and substantial change" GM claims that the J575e test has been "abandoned by the industry" as "obsolete" and "non-repeatable", and asked NHTSA to adopt the vibration test proposed, or the one specified in SAE J575 June 80.

NHTSA disagrees with GM's characterization of J575e. Although the test in the earlier version may use less modern equipment than the later one, NHTSA continues to regard J575e as more closely approaching on-road vibration characteristics. Further in adopting the vibration test of J575e, NHTSA considered it a logical outgrowth of the preceding notice and comment period and not such a deviation from the course of the rulemaking as to warrant, in all fairness to the public, a new notice offering opportunity to comment. To impose the same SAE vibration test upon semi-sealed headlamps as is required for all other types of headlamps and lighting equipment, instead of the proposed test containing certain characteristics of a later version of that SAE standard, cannot be said either to be unfair or outside the penumbra of the proposed rulemaking. GM's petition is denied.

Tolerance on Wattage and Spherical Candlepower. GM asked for an amendment of paragraph S4.1.1.38(b)(1) for a tolerance of ±12 percent of bulb lumens. Sylvania asked for a ±10 percent tolerance on lumens, claiming that this is the current industry standard.

Sylvania's petition is granted, and the standard amended to allow a tolerance of ±10 percent. This should allow industry to comply with reduced costs attributable to lesser bulb rejection. GM also asked for a tolerance of ±7½ percent on upper and lower beam wattages. The values given are maximum and therefore a tolerance is not appropriate. For this reason, the GM petition is denied.

Windshield Washer Fluid. The agency incorrectly spelled the washer fluid component in paragraph S6.4(b)(4) as "monethinalamine". It is corrected to read "monoethanolamine."

The percentage of this test fluid used in the chemical resistance test was given as 1.5. GM, the manufacturer of the fluid, states that this is the correct percentage in bulk form, but that when the fluid is diluted with two parts water for normal recommended usage, the correct percentage is 0.5. GM's petition is granted, and an appropriate change is being made.

S4.1.1.38(b) and S6.7.2(c) Minor Amendments. Sylvania requested a clarification that a headlamp assembly in the life test be in the normal operating attitude. It further requested that the 12.8 and 14 volts noted in this section be specifically identified as design and rated voltage, respectively. The agency agrees and clarifying amendments are made.

The agency is also clarifying the heat test procedure to insure that the headlamp achieves maximum head dissipation by being operated on its highest wattage filament.

Paragraph S7 Bulb Deflection Test. Sylvania commented that to allow a permanent deflection of .005 inch after a 4-pound load is more severe than the bulb will experience in practice, and suggested that the requirement be amended to allow deflection of .010 inch after a 2-pound load, which "is more reasonable and economically practical."

The agency does not agree with this suggestion. The danger of misaim due to bulb deflection requires assurance that the bulb will not move in the base during handling and installation.

Paragraph S8 Aiming Adapters. Ford, the only manufacturer currently known to NHTSA who intends to use the new headlamp system during the 1984 model year, has called to NHTSA's attention that paragraph S8 specifies an adjustable adapter for use during the first year rather than a fixed adapter as discussed in the preamble.

NHTSA's specification of the adjustable adapter for the first year was in error, and Ford's petition for substitution of a fixed adapter is granted. The adapter will allow lamps to be aimed mechanically by a mechanical aimer conforming to SAE J602.

It remains the intention of NHTSA that adjustable adapters be available for use when mechanical aimers are modified to allow their use. Although Standard No. 108 is being amended to no longer require adjustable adapters, NHTSA is retaining the requirements for headlamp markings to assist in aiming with adjustable adapters conforming to the design specified in the June admendment (Figure 9) expected to become available by July 1, 1984. GM requested a change that would allow 45 degrees of adjustment. An extreme angle of a headlamp lens, such as 45 degrees, not only reduces light transmittance but also creates a distortion in the beam pattern more likely to create glare. Therefore GM's petition is denied.

Four-Lamp Headlamp System. VW asked for an admendment of paragraph S4.1.1.36 which would allow use of a four-lamp replaceable bulb headlamp system with only two bulbs illuminated on either high or low beam. GM, in a letter to the agency after the reconsideration period, inquired whether two bulbs could be used in a single headlamp cavity. The original petition from Ford was based on a two-lamp system and the standard as adopted allows only a two-lamp system with a single dual-filament bulb in each headlamp. A number of issues would need to be resolved before allowing use of a dual-filament bulb in a four-lamp configuration, or two dual-filament bulbs in a single cavity. These issues involve, in the case of the VW petition, whether only two lamps should be illuminated on high beam (four are presently required) and if so, whether it is important that the front corner of the vehicle be otherwise indicated. These issues also involve simultaneous actuation of light filaments in a headlamp system which could produce excessive illumination and uncertainties in the ability to insure correct simultaneous high beam or low beam aim if the bulb reflector systems are not separate high and low beam units. VW's petition and GM's request are denied.

Deletion of Certain Tests for Glass-Lensed Headlamps. VW petitioned for deletion of certain environmental tests on the basis that they were inappropriate for headlamps with glass lenses. These tests are those covering chemical resistance, temperature, internal heat, and impact.

NHTSA has decided to grant in part and deny in part this petition. The agency does not agree that temperature tests are unnecessary for glass-lensed metal reflector lamps. This test checks the expansion and contraction of the seal of the lens to the reflector. As metal is a conductor and glass basically an insulator, a large temperature differential will occur on these lamps, and a test to verify the existence of a good seal is required. On the other hand, all glass lenses should easily pass the chemical and internal heat test and these requirements may be deleted for glass-lensed lamps without affecting the overall quality of the lamp. Accordingly, appropriate amendments are made to paragraph S4.1.1.36(c)(1).

Paragraph S6.8, Humidity Test. VW petitioned for deletion of the requirement in the humidity test that the photometric test begin within 10±1 minute after the humidity exposure. Apparently VW's photometric test equipment is not located near the humidity chamber. The purpose of the time restriction is to insure that all photometric testing after a humidity test occur within 2 minutes of each other for repeatability of results. NHTSA is therefore denying VW's petition on this point.

Deletion of Reference Dimensions. Because reference dimensions are advisory and not mandatory, the agency is revising Figures 3-2, 3-6, and 3-8 to delete them, to clarify that manufacturers may choose dimensions that they deem appropriate. These deletions do not affect interchangeability of replacement light sources.

Correction of Errors. Several errors occurred in the rule concernig improper references to Figures and cross-references to test procedures. These are now corrected.

PART 571—[AMENDED]

§ 571.108 [Amended]

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

1. The definition of "standardized replaceable light source" contained in Section S3 Definitions is amended by changing "Figure 1" to "Figure 3".

2. In the second sentence of paragraph S4.1.1.36(a)(2), the words "the aiming device locating plate" are amended to read "an aiming device locating plate conforming to Figure 9."

3. Paragraph S4.1.1.36(b) is amended by changing the word "headlight" to "headlamp".

4. Paragraph S4.1.36(c) is revised to read:

(c) A headlamp with a glass lens need not meet the following tests of the sections specified: abrasion resistance (S6.2), chemical resistance (S6.4), and impact (S6.9). If, in addition to a glass lens, the headlamp uses a non-plastic reflector, it need not meet the internal heat test of section S6.7.2.

5. Paragraph S4.1.1.36(d)(4) is amended by revising the final sentence to read: "Corrosion may occur on terminals provided there is no loss of function."

6. Paragraph S4.1.1.36(d)(8) is amended by changing "S6.11" to "S6.9".

7. Paragraph S4.1.1.38(b)(1) is revised as follows:

The general specifications of the bulb shall be:

	Low beam	High beam
Maximum power, watts at 12.8 V (design voltage).	50...........	70
Lumens (without black cap) at 12.8 V design Voltage.	1,067±10%...	1,738±10%
Average life at 14.0 V rated voltage (life testing is conducted in a finished headlamp assembly placed in the normal operating attitude).	320 hrs......	150 hrs.

8. Paragraph S6.1 is amended by adding "S6.5" between "S6.4" and "S6.6".

9. Paragraph S6.2(c)(2) is revised to read:

(2) The abrading pad support shall be equal in size to the pad and the center of the support surface shall be within ±.08 in. (²2 mm) of parallel to the lens surface.

10. Paragraph S6.4(b)(4) is amended by changing "1.5% monethinalamine" to "0.5% monoethanolamine".

11. Paragraph S6.5 is amended by deleting the last sentence.

12. The second sentence of paragraph S6.7.2(c) is revised to read:

(c) . . .The headlamp shall be soaked for one hour at a temperature of 95°F [35°C] and then its highest wattage filament shall be energized for one hour in a still air condition, allowing the temperature to rise from 95°F [35°C].

13. Paragraph S8 is revised to read:

S8. *Mechanical aiming fixed adapters for replaceable bulb headlamps.* Each motor vehicle manufactured on or after July 1, 1983, and before July 1, 1984, which is originally equipped with a replaceable bulb headlamp system, shall be furnished with a pair of fixed headlight aiming adapters for mechanical aimers. Each fixed adapter shall be provided with a lens to suction cup interface that allows the headlamp to be usable with a mechanical aimer. Each adapter when mounted on the headlamp in contact with the aiming pads prescribed by S4.1.1.36(a)(2), shall provide a surface perpendicular to the longitudinal axis of the vehicle so that the lamp may be mechanically aimed by a mechanical aimer conforming to SAE Standard J602, Oct 80, *"Headlamps Aiming Device for Mechanically Aimable Sealed Beam Headlamp Units."*

14. Figures 3-1 through 3-8, Figure 5, Figure 6, and Figure 9-2 are revised, and new Figures 3-10 and 3-11 are added.

Issued on September 26, 1983.

Diane K. Steed,
Deputy Administrator.

48 FR 44815
September 30, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment

[Docket No. 81-02; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 108 to require installation of a single center, high-mounted stoplamp on passenger cars, in addition to the stoplamps presently required. Since the new stoplamp is a single-function lighting device providing an unambiguous signal, and as it would be closer to the forward line of sight of following drivers, it will reduce rear-end collisions by providing a more effective indication to those drivers that the car ahead is slowing or stopping. The amendment is supported by field test data indicating that the reduction in rear-end collisions would be significant. A proposal on this subject was issued on December 31, 1980, and published on January 8, 1981 (46 FR 2132).

EFFECTIVE DATE: September 1, 1985.

SUPPLEMENTARY INFORMATION: Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* (49 CFR 571.108) presently requires passenger cars to be equipped with two stoplamps, mounted on the rear, one on each side of the vertical centerline, as far apart as practicable, and at the same height, which is not less than 15 inches, nor more than 72 inches above the road surface. Notwithstanding those stoplamps, the problem of rear-end collisions remains very large.

The Rear-End Collision Problem

Of the 4,200,000 rear-end collisions in 1980 (Accident Facts, 1981 edition, p. 47), NHTSA estimates that approximately 3,500,000 were rear end collisions in which a passenger car was struck from behind by another motor vehicle. Based on agency studies, it is estimated that 2,344,000 of the struck passenger cars had their stoplamps on at the time of the collision. Data from NHTSA's Fatal Accident Reporting System (FARS) for 1980 showed 1,104 fatalities in accidents involving rear-impacted passenger cars and data from NHTSA's National Accident Sampling System (NASS) showed 603,000 injuries in those accidents.

As NHTSA noted in the January 1981 proposal, the rule under discussion is the culmination of many years of NHTSA and industry-funded research on vehicle rear lighting systems. Early research findings advocated the separation of rear lamps and signals to improve recognition and response to the different functions. Research conducted in the private sector had concluded that reaction time, especially at night, was significantly faster when lamps were high-mounted.

Although NHTSA was encouraged by this research, the agency decided that more data were needed since the research was based on limited real-world testing. Thus, in 1977 NHTSA contracted with Essex Corporation to make a study and field test evaluation of rear lighting systems. The results of this study are contained in Report No. DOT-HS-803 467, "Field Test Evaluation of Rear Lighting Systems," 1978.

The purpose of this study was to determine whether equipping cars with one or more of three experimental rear lighting and signaling systems would result in a significant reduction in rear-end collisions compared to cars equipped with the current conventionally configured (low-mounted) rear lamps under actual traffic conditions. The three experimental systems were:

1. A single center, high-mounted stoplamp. This stoplamp was installed at the approximate eye level of a following driver. The stoplamp was positioned on the vehicle's trunk just beneath the centerline of the back window. This stoplamp was supplemental

to the normal low-mounted stop and turn signal lamps of the vehicle.

2. A dual high-mounted stop and turn signal lamp system. Two high-mounted stoplamps, one on each side of the trunk directly below the back window, were installed at the approximate eye level of a following driver. These stoplamps were supplemental to the normal low-mounted stop and turn signal lamps of the vehicle.

3. A functionally-separated system. The tail lamp was separated from the stop and turn functions of existing low-mounted lamps of the vehicle.

Approximately 2,100 taxicabs in the Washington, D.C. area participated in the study. The taxicabs were divided into four equal groups. Three of the groups were equipped with one of the three experimental concepts while the fourth or control group was equipped with conventionally configured rear lamps. During the 12-month study period, the four groups accumulated a combined total of nearly 60 million miles under a broad range of weather and road conditions. Drivers in the four groups had been matched for age, sex, and prior accident record. At the end of the study, the four groups had experienced a total of 1,470 accidents, of which 217 or 15 percent involved taxicabs being struck in the rear while in operation.

The most significant finding of the study was that the rate at which taxicabs equipped with a single center, high-mounted stoplamp were involved in 54 percent fewer relevant rear-end collisions than were experienced by the control group. A relevant rear-end collision is one in which a stoplamp could have affected the outcome. Nonrelevant rear-end collisions, e.g., the striking of the rear of a parked car by a moving car, were excluded. This reduction, which was demonstrated to be statistically significant, was achieved whether measured in terms of absolute number or frequency of accidents or in terms of accident rate per million vehicle miles. In addition, of all the cabs struck in the rear, those with the center, high-mounted stoplamp had the lowest mean cost of repair. This indicated that these accidents were less severe than accidents involving vehicles with other stoplamp systems.

To determine whether the drivers of cabs equipped with experimental lamps drove more carefully than drivers in the control group, a comparison of the groups was made based on non-rear-end accidents. The results of this comparison indicate no statistically significant differences between any of the three experimental groups and the control group. The similarity of experience in those crash modes and the difference in rear-end crashes supports the finding in the Essex study that the supplemental single center high-mounted stop signal has the potential to dramatically reduce the occurrence of rear-end collisions.

The Essex report recommended that another field study be conducted, using a broader sampling of drivers, passenger cars, and traffic conditions in order to validate its findings. The Allen Corporation contracted to make this validation study and the results are given in the May 1980 report "Validation of the Reduction of Rear-End Collisions by a High-Mounted Auxiliary Stoplamp," (DOT-HS-805 360).

Accident and exposure (mileage) data were collected on approximately 5,400 telephone company passenger cars, about 2,500 of which were equipped with the single, high-mounted stoplamp. The remaining cars had only conventionally configured stoplamps and served as the control group. The vehicles were operated by seven companies of the Bell Telephone System from New England to Florida, and also in Illinois and California. Data were collected from January 1, 1979, through December 31, 1979. During that time, the vehicles were driven a total of approximately 55 million miles.

The test group received 53 percent fewer rear-end impacts than did the control group. The difference was statistically significant beyond the 99 percent level of confidence. The result is in agreement with the Essex study which found a 54 percent reduction in rear-end impacts. Therefore, the agency tentatively concluded that the single high-mounted stoplamp would provide significant safety benefits beyond those obtained from the safety lighting required by Standard No. 108, and issued its January 1981 proposal for the installation of such a stoplamp.

As proposed by NHTSA, the high-mounted stoplamp would have been required to have an effective projected luminous lens area not less than 4½ square inches in size. A vibration test was specified, under which the lamp would have been energized during the final ten minutes of the test, and required to be functioning at the end. A turn signal, stop, or tail lamp would not have been permitted to have its edge closer than 10 inches to the edge of the high-mounted lamp. Three slightly different alternative locations for the high-mounted lamp were proposed (discussed in more detail below). A common feature of each was that, if mounted inside the vehicle, the lamp would have been required to be provided with means to prevent glare. The photometric requirements would have been those of SAE Recommended Practice J186a "Supplemental High Mounted Stop and Rear Turn Signal Lamps," September 1977, which specifies a maximum of 60 cp for a red supplemental stop lamp.

Since issuance of the proposal, there has been a further field study which verifies the earlier findings. That study, "A Field Test of Two Single High-Mounted Brake Light Systems," was sponsored by the Insurance Institute for Highway Safety (IIHS), and completed in April 1981. The objective of the study, conducted on a fleet of 900 taxicabs operating in New York City, was to establish the effectiveness of single, high-mounted brake lamp configurations in reducing rear-end collisions between vehicles stopping or slowing down.

The most significant finding of the study was that taxis equipped with a single center high-mounted stop lamp had almost 50 percent fewer rear end collisions than those experienced by a control group of cabs having a conventional rear light configuration. Two versions of the high-mounted stoplamp were evaluated by the study. One employed a single bulb (44 percent reduction) and the other dual bulbs in a single housing (58 percent reduction). The two bulbs were brighter than the single bulb.

Discussion of Comments

Effectiveness on Small Cars

One of the major issues raised was the effectiveness of the center high-mounted stoplamps on subcompact cars. Critics of both the Essex and the Allen studies observe that subcompacts were not included in the Essex study and were included in relatively small numbers in the Allen study. Further, even though 329 or 11.2 percent of the 2,927 control cars used in the Allen study were subcompacts, none of these subcompacts were involved in a "relevant" rear-end collision during the test period. This fact has led to the conjecture by some commenters that subcompacts may actually be involved in relevant rear-end collisions to a significantly lesser extent than large cars and that as large cars are slowly being replaced in the fleet by small cars, there will be fewer vehicles involved in relevant rear-end collisions in the coming years. Thus, the effectiveness of center, high-mounted rear stoplamps on subcompact models was questioned.

In response to this criticism, the agency obtained data on all police-reported accidents involving passenger cars struck in relevant rear-end collisions in North Carolina for each year from 1975 through 1980. These data were obtained by size of car (e.g., large, intermediate, compact, subcompact, and foreign).[1] The results of this study were:

a. For each year, except 1976, and for the average of all years combined there were no statistically significant differences in relevant rear-end accident rates between intermediate, compact, and subcompact domestic cars. However, during 1976, significantly more subcompacts were struck in the rear as compared to compacts and intermediates.

b. For each year, there was a significantly lower relevant rear-end accident rate for large passenger cars compared to smaller ones.

c. In general (average of all years combined), the relevant rear-end accident rate for foreign cars was significantly higher than those of domestic compacts and subcompacts. However, in 1976 and 1977 the accident rate of the foreign and domestic compacts and subcompacts was essentially equivalent.

d. For each size passenger car and for the average of all passenger cars combined, there was no significant change in the rate of occurrence of relevant rear-end accidents from 1975 through 1978. Significantly lower rates were noted in 1979 and 1980, except for foreign cars.

These results are based on North Carolina accidents only, and for the years indicated. However, the North Carolina accident experience is believed to be comparable to that of the Nation taken as a whole for any year. The proportion of municipal and rural roadway mileage of North Carolina and the United States is virtually identical; the motor vehicle death rate for 100 million vehicle miles is only .14 percent higher in North Carolna, while the number of registered drivers per 1000 persons is only 25 persons higher than the national average. Therefore, these results are strong evidence to indicate that, in general, the fact that a passenger car is smaller than average does not suggest that the car is more likely or less likely to be a struck vehicle in a relevant rear-end collision.

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[1] Foreign cars could not be broken down by size of car. Consequently, the size groups listed are for domestic passenger cars. NHTSA has subsequently learned that in the years 1975-80 about 90 percent of the foreign cars registered in North Carolina were subcompacts and about 9 percent were compacts.

The rear-end accident rate for foreign cars was significantly higher than that for compact and subcompact domestic cars.

Further information pertinent to the issue of subcompact cars' effectiveness is provided by past research on braking perception reaction time sponsored by General Motors at the University of Michigan Transportation Research Institute (formerly the Highway Safety Research Institute). One of the vehicles used to test for reaction time was a subcompact. A statistically significant reduction in reaction time occurred in urban areas when the center high-mounted stoplamp was added to that subcompact.

Another theory set forth is that the center high-mounted stoplamp on a subcompact car may not be perceived by following drivers as being higher than the conventionally configured stoplamps. Thus, subcompacts may not experience the same reductions in collisions as larger cars will. To determine the precise effectiveness of the center high-mounted stoplamp on subcompacts would require additional testing. However, the agency examined typical mounting heights (H_2) for the center lamp and compared these to the current brake light mounting heights (H_1) for subcompacts and larger vehicles. The difference in height (H_2-H_1) was on average 2.35 inches less for subcompacts than larger vehicles (10.35 to 12.7 inches) and 3.3 inches less for the diagonal (24.0 to 27.3 inches). Thus, the differences between the center high-mounted stoplamp for subcompacts is 82 percent and 88 percent of the difference for larger cars. Based on this analysis and the previous discussions, the agency concludes that the center high-mounted stoplamp will be as effective for subcompacts as for the larger tested vehicles. Even if subcompacts only achieved 80 percent of the benefit of larger cars, they would be highly cost-effective.

Number of High-Mounted Stoplamps

Many of the automobile manufacturers commented on the issues of whether the final rule should require only one rather than two high-mounted stoplamps, as well as where the lamp or lamps should be located. Manufacturers argued that the agency should not be so design restrictive as to specify installation of only a single high-mounted stoplamp. The automobile industry generally favored the use of two high-mounted stoplamps located closer to the sides of a vehicle, in order to provide more styling flexibility. The agency does not agree with this comment because the data show that the single-lamp design is more effective.

The Essex field test results show that the dual high-mounted lamps are not so effective as the single high-mounted lamp. One of the experimental groups in the field test consisted of vehicles with two high-mounted combined stop and turn signal lamps. This group did not experience a statistically significant reduction in rear-end accidents compared to the control groups.

Location

The 1981 NPRM asked for comments on three alternative locations as follows:

Alternative 1

Each high-mounted stoplamp would have been required to be mounted not less than 34 inches above the road surface:

(a) If practicable, outside the passenger car with the center of the lamp within 3 inches of the outside bottom edge of the rear window daylight opening, or

(b) If compliance with paragraph (a) of this section were not practicable, inside the passenger car with the center of the lamp not more than 3 inches above the inside bottom edge of the rear window daylight opening and with means provided to minimize reflections inside the vehicle from the light upon the rear window glazing, or

(c) If compliance with neither paragraph (a) nor (b) of this section were practicable, outside the passenger car with the center of the lamp within 3 inches of the outside top edge of the rear window daylight opening.

Alternative 2

Each high-mounted stoplamp would have been required to be mounted inside or outside the passenger car with the center of the lamp not less than 34 inches and not more than 50 inches above the road surface, and not more than 3 inches below the bottom or above the top of the rear window daylight opening. If the lamp were mounted inside the vehicle, means would have been required to be provided to minimize reflections inside the vehicle from the light upon the rear window glazing.

Alternative 3

Each high-mounted stoplamp would have been required to be mounted:

(a) If practicable, outside the passenger car with its center not less than 38 inches above the ground surface and within 3 inches of the bottom of the rear window daylight opening, or

(b) If compliance with paragraph (a) of this section were not practicable, inside the passenger car with its center as near as practicable to 38 inches above the road surface, and with means provided to minimize reflections inside the vehicle from the light upon the rear window glazing.

In general, commenters recommended Alternative 2, the least design-restrictive alternative. However, all the commenting automobile manufacturers, both domestic and foreign, recommended changes to the alternatives. Some wanted a minimum mounting height of 30 inches while others wanted the minimum to be 34 inches. Some agreed that the minimum separation distances between the high-mounted stoplamp and other rear lighting devices should be the proposed 10 inches, others wanted 15 inches. A few manufacturers asked deletion of the proposed requirement that the lamp be within 3 inches of the back window daylight opening. Some manufacturers wanted the decision whether to install the lamp inside or outside the car left to their discretion, and some wanted the option to place the lamp off-center to avoid interfering with the operation and location of rear windshield wiper systems. At least seven different locations were suggested by commenters to accommodate problems presented by different vehicle configurations. For sedans, the suggested locations were the trunk lid or the panel between the trunk lid and the rear window; for hatchbacks, the roof or the hatch; for station wagons, the roof or the tailgate. The seventh location suggested was forward of the rear window (i.e., inside the vehicle).

Based on these comments, the agency decided that none of the three alternatives would adequately accommodate the design problems involved in attempting to install center high-mounted stoplamps on all sizes and body types of cars. Accordingly, NHTSA has decided to eliminate many of the design constraints imposed by the three proposed location alternatives. The final rule requires only that the lamp be located on the vertical centerline of the vehicle, with no portion of the lens higher than the top of the back window nor lower than 3 inches below the bottom. NHTSA did not agree that hatchbacks and station wagons necessitated mounting the lamp on the roof, as it may be mounted at any point on the vehicle centerline within the parameters indicated. The lamp can either be inside or outside the back window. However, if it is inside, means shall be provided so that no reflections from the light of the lamp upon the rear glazing shall be visible to the driver when viewed indirectly in the rearview mirror or viewed directly. NHTSA has concluded that notwithstanding the increased latitude provided by this rule in lamp placement, the new lamp will still afford the visual cues that proved so effective in the field studies.

Lead Time

NHTSA has also decided to establish an effective date of September 1, 1985, i.e., the 1986 model year. This will provide a 2-year lead time. The agency believes that this lead time represents an appropriate balance between minimizing the period in which center high-mounted stoplamps will have to be added to existing models instead of designed into new models and beginning implementation of a very cost-effective requirement that will reduce accidents and injuries.

Photometrics

Volkswagen, SAAB, JAMA, Stimsonite, and TSEI recommended that the high-mounted stoplamp have higher photometric requirements than were proposed. The NPRM proposed a minimum of 15 cp and a maximum of 60 cp at the H-V point. Volkswagen recommended that there be a minimum of 40 cp and that the maximum be increased from 60 cp to 75 cp. The JAMA recommended that the stoplamp intensity be increased.

The research performed by Essex and Allen used stoplamps that were intended to meet the photometric requirements of SAE J186a, a minimum of 15 cp and a maximum of 60 cp at the H-V test point. The measurement on a typical sample lamp used in these studies was 32 cp at H-V, but with a maximum of 47 cp. Although the results of these studies showed reduced rear-end collisions, the comments to the docket argue for a higher limit. The agency is especially impressed by the results of the IIHS study where a 58 percent reduction in collisions was achieved using two bulbs. The candela of the two-bulb design was 126 candela at H-V with a maximum of 150. NHTSA has concluded that these results are convincing enough to justify adopting a minimum of 40 cp and a maximum of 160 cp at the H-V point, and the final rule so specifies. It is reasonable to believe that this increse will provide better detection during periods of dusk and dawn, improved visibility when the lamp lens becomes dirty, and better visibility of an inside-mounted lamp through the back window (because the window reduces the light transmittance).

Lamp Size and Shape

The NPRM specified 4.5 square inches as the minimum size of the lamp. This size of lamp was used in the research performed by Essex and Allen. In view of the favorable results obtained in those studies and in the absence of comments providing convincing arguments for a different size, 4.5 square inches is retained in the final rule. The amendment leaves the shape to the judgment of individual manufacturers.

Acclimatization Factor

A number of comments argued that once all cars are equipped with the high-mounted stoplamp, it will no longer be effective because all drivers will be "acclimatized" to its effect. According to this argument, the additional lamp will show advantages only when lamps exist on small percentages of vehicles in the total vehicle population.

The agency does not consider this argument to have merit. The addition of a single, high-mounted stoplamp on the centerline of the vehicle has several direct benefits which the agency believes will be of lasting effect. One effect is that its presence on a vehicle (vehicle 1) gives the operator of the immediately following vehicle (vehicle 2) an additional "cue" on the centerline of his vision. A second is that the driver (driver of vehicle 3) behind vehicle 2 will be able to see through that vehicle (if that vehicle is a car) and obtain advance warning about the response of vehicle 2 to vehicle 1. A third benefit is that the supplemental stoplamp will have only one possible meaning as opposed to a stoplamp in the same housing as a tail lamp: to indicate that a vehicle is slowing to stop or has stopped. In addition, the candela values adopted are substantially higher than those of lamps in the test fleets, increasing the likelihood that their signal will be perceived by following drivers.

The agency will evaluate the experience of cars equipped with the high-mounted stoplamp over a period of time and determine if there is any acclimatization. The acclimatization factor cannot be definitively determined in the absence of a substantial test fleet. The agency believes that it is at least as likely that the effectiveness of the lamp will increase as decrease in proportion to the percentage of vehicles equipped with it.

Vibration Tests

It was proposed that a high-mounted stoplamp be required to continue to provide illumination upon completion of the vibration test specified in SAE J575e. Some commenters disagreed with this requirement. The Japanese Automobile Manufacturers Association (JAMA) stated that the vibration resistance of a bulb is usually determined by making an impact test as defined in SAE J603. In the case of ordinary lamps, the breaking of a filament in the vibration test defined in SAE J575 is excluded.

JAMA argued therefore that since the conditions for mounting the stoplamp are the same as those of existing lamps such as license plate lamps, the same vibration tests should suffice. The California Highway Patrol noted that the test appeared to be oriented towards the integrity of the bulb rather than the lamp since it does not permit a failed bulb to be replaced.

The vibration section of SAE J575e was designed as a test for vehicle lamp fixtures to assure that they would not be destroyed or become ineffective in service, and that the fixture mounting was stable. It was not intended to assess the durability of bulbs. Almost all bulb failures result from using up (by boiling away) tungsten of the filament during normal operation or by a fracturing of the filament. Before a filament has been burned, it is quite ductile and can withstand substantial physical abuse without breaking. But after it has been submitted to the 4500-4800°F temperature at which it normally operates, significant changes begin to occur. As the filament is burned, the tungsten takes a different crystalline structure and in time becomes fairly brittle. Thus, as the bulb is burned in normal usage, the filament becomes mechanically weaker from the boiling away of tungsten and less tolerant of physical shock and vibration because it has become more brittle as well.

For these reasons, the agency has decided that the lamp, but not the bulb, will be subject to the vibration tests, consistent with treatment of other vehicle lamps covered by Standard No. 108.

Tailgating Education

A concerned citizen asked whether an educational program to inform the public of the hazards of "tailgating" would be more effective in reducing rear-end collisions than the installation of the high-mounted stoplamps.

For many years there have been driver education programs in public and private schools. All these courses have emphasized the hazards of driving too close to the preceding vehicle. Despite the education programs, no significant reduction in rear-end collisions appears to have resulted. In constrast, the effectiveness of the installation of center, high-mounted stoplamps in significantly reducing rear-end collisions has been demonstrated in three separate field studies.

Rural Accidents

A number of commenters correctly pointed out that the field studies (Essex, Allen, and IIHS) involve mainly urban driving. Thus, there are no data on the effectiveness of the high-mounted stoplamp in predominantly rural driving, even though some test fleet vehicles were occasionally operated in rural areas. Accordingly, the agency is assuming for strictly analytical purposes that the stoplamp will not have any effectiveness in rural driving. This assumption does not mean that NHTSA anticipates that there will not be any benefits in rural driving. The agency believes that there will be some currently unquantifiable benefits and is not aware of any evidence negating the possibility of such benefits.

Summary of Decision

NHTSA is therefore requiring that passenger cars manufactured on or after September 1, 1985, be equipped with a center high-mounted stoplamp. The lamp must be red, with a minimum effective projected luminous lens area of 4.5 square inches and must be designed to meet the requirements of SAE Recommended Practice J186a "Supplemental High Mounted Stop and Rear Turn Signal Lamps," September 1977, except that the laboratory requirements are in accordance with SAE J575e, and the photometric requirements are those specified by NHTSA. The current stoplamp requirements and functions are retained. The center high-mounted stoplamp would be actuated by the stoplamp switch. The lens center of the lamp must be mounted on the vertical centerline of the car as seen from the rear. Because of the variety of passenger car types and the need of the manufacturers to incorporate the lamp into their designs in an economical and orderly manner, it is hereby found that an effective date slightly less than 2 years after the issuance of this rule is necessary to provide adequate lead time and therefore is in the public interest.

Alternatives

With additional research, more nearly optimum specifications for stoplamp configurations may be developed. These factors may include more effective intensity, size, beamspread, and location. Other types of lamps or added functions such as deceleration signals may be desirable and should be investigated. However, to delay this rulemaking to await new improvements will result in delay of implementing requirements known to appreciably reduce accidents.

The agency also considered exempting subcompacts from the requirement. While the agency does not have a conclusive test of subcompacts with the center lamp, it knows of no reason why a center high-mounted stoplamp would not be equally effective for subcompacts.

Other alternatives now being investigated include radar or automatic braking and radar warning devices. Radar or automatic braking or warning systems have been developed and may be available as optional systems. Other systems are being developed and may also be available as optional systems. However, time will be needed to test and evaluate these systems. At least several years are likely to pass before there is a possibility that any of these systems can be proved sufficiently effective, reliable, and free of problems for the agency to consider initiating any rulemaking to permit and regulate their use. Further, the cost for automatic braking or radar warning would probably be many times the cost of the high-mounted stoplamp.

Potential Benefits, Costs, and Other Impacts

NHTSA has considered the impacts of this rule and determined that the rule is major within the meaning of Executive Order 12291 and significant within the meaning of Department of Transportation guidelines. A regulatory impact analysis discussing those impacts has been prepared and placed in the docket. A copy of the analysis may be obtained free of charge from the Docket Section whose address is given near the beginning of this notice.

Benefits

The Essex study found that for taxicabs in the Washington, D.C. area, the center high-mounted single-function stoplamps reduced relevant rear-end collisions by 54 percent. Similarly, the Allen study found that for telephone company passenger cars operating with these stoplamps in many areas of the country, relevant rear-end collisions were reduced by 53 percent. The IIHS study indicated a 44 to 58 percent reduction. Had all passenger cars been equipped with the center high-mounted stoplamp, NHTSA estimates that there would have been 900,000 fewer accidents and 40,000 fewer injuries in 1980. Available research data do not permit the agency to estimate the effectiveness of the center high-mounted stoplamp in reducing fatalities. However, the agency believes that it is reasonable to expect that the new stoplamp could reduce fatalities through making possible timely evasive action or reduction in impact speed.

In view of the potential that this rule offers in reducing traffic accidents and injuries occurring in such accidents, NHTSA has determined that promulgation of the rule is within the authority delegated by law and consistent with congressional intent, as expressed in the mandate of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1381 *et seq*), an act whose purpose is "to reduce traffic accidents and deaths and injuries resulting from traffic accidents." This rule satisfies the statutory criteria of meeting the need for safety, being practicable, and being stated in objective terms. NHTSA has further determined that the factual conclusions upon which this rule is based have substantial support in the agency record, viewed as a whole, with full attention to public comments in general and the comments of people directly affected by the rule in particular.

A center high-mounted system would also reduce property damage. Data on the cost to repair damage from rear-end collisions on a national scale were not available. However, both the Essex and Allen studies reported on repair costs of relevant rear-end accidents for their test fleets. The mean average repair costs per vehicle in the two studies were, consecutively, $402 for the control group and $271 for the single high-mounted stoplamp group (1982 dollars).

Based on the data summarized above, more fully set forth in the final regulatory impact analysis, NHTSA estimates that approximately $434 million (1982 dollars) would have been saved in 1980 in repairs by the avoidance of approximately 900,000 rear-end collisions and, on average, a lessening of severity in another 900,000 relevant rear-end collisions.

Costs

Manufacturers estimated that a high-mounted stoplamp will add an average of $8 to $15 to the price of each car. NHTSA's estimated consumer costs range from about $4 (for integration of the lamp into new vehicle designs) to about $7 (for adding the lamp to existing vehicle designs). The figures in this range include the cost of installation. Resolution of the differences between these estimates is not possible since the manufacturers did not provide any detailed explanation or support for their estimates. The bases for the agency's two independent estimates are set forth in the regulatory impact analysis. The initial annual consumer cost of the high-mounted stoplamp is expected to be approximately $70 million, based on an annual production of 10 million passenger cars. By model year 1988, when virtually all coupes, sedans, and station wagons could be redesigned to incorporate the lamp, the total annual consumer cost should fall to $40 million or an average cost of $4 per stoplamp per car.

Combining the benefits from reductions in property damage and costs of the high-mounted stoplamp yields a net benefit of $394 million per year. (Even if the highest of the unexplained cost figures from the manufacturers were used, there would still be net benefits of $284 million.) These net benefit figures are based on the agency's estimate that the stoplamp would be 50 percent effective in reducing relevant rear-end collisions involving passenger cars in urban areas. If the stoplamp were only 5 percent effective in reducing rear-end accidents, economic costs would just equal economic benefits (exclusive of reductions in injuries or fatalities) in the long run.

The agency anticipates that maintenance and operating costs of the new lamp will be minimal.

Potential Environmental Impacts

This action will not have a significant effect on the environment. NHTSA estimates that the increased fuel consumption caused by adding approximately one-half pound of weight to each car would be only 0.05 gallon per year. This would be a minor increase in use of fuel. The burning of this additional amount of gasoline would also be a negligible factor in air pollution. There are no other known negative environmental impacts.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108 is amended as follows:

1. Table III is amended to add the following new item of lighting equipment after "stoplamps":

TABLE III—REQUIRED MOTOR VEHICLE LIGHTING EQUIPMENT

All passenger cars and motorcycles, and multipurpose passenger vehicles, trucks, trailers, and buses, of less than 80 inches overall width

Item	Passenger cars, multipurpose passenger vehicles, trucks and buses	Trailers	Motorcycles	Applicable SAE standards or recommended practices
*	* *	*	*	* *
High-mounted stoplamp	1 red, effective September 1, 1985, for passenger cars only	Not required	Not required	J186a, September 1977, except that Table 1 in that standard is replaced by Figure 10
*	* *	*	*	* *

2. Table IV is amended to add the following new item of lighting equipment after "stoplamps":

TABLE IV– LOCATION OF REQUIRED EQUIPMENT

All passenger cars and motorcycles, and multipurpose passenger vehicles, trucks, trailers, and buses, of less than 80 inches overall width

Item Column 1	Location on: Passenger cars, multipurpose passenger vehicles, trucks, trailers, and buses Column 2	Location on: Motorcycles Column 3	Height above road surface measured from center of item on vehicle at curb weight Column 4
* *	* *	* *	*
High-mounted stoplamp	On the rear, on the centerline [See S4.3.1.8], effective September 1, 1985, for passenger cars only	Not required	[See S4.3.1.8]
* *	* *	* *	*

* * * * * * *

3. New paragraph S4.1.1.41 is added to read:

S4.1.1.41 Each high-mounted stoplamp shall:

(a) Have an effective projected luminous area not less than 4½ square inches.

(b) Have a signal visible to the rear through a horizontal angle from 45 degrees to the left to 45 degrees to the right of the longitudinal axis of the vehicle.

(c) Have the minimum photometric values in the amount and location listed in Figure 10. At the axis reference H-V (where $H=0°$ and $V=0°$), the intensity shall be not less than 40 and not more than 160 candela.

(d) Provide access for convenient replacement of the bulb without the use of special tools.

4. New paragraph S4.3.1.8 is added to read:

S4.3.1.8 Each high-mounted stoplamp shall be mounted with its center on the vertical centerline of the passenger car as the car is viewed from the rear. No portion of the lens shall be higher than the top of the back window or lower than 3 inches below the bottom of the back window. If the lamp is mounted inside the vehicle, means shall be provided so that no reflections from the light of the lamp upon the rear window glazing shall be visible to the driver when viewed indirectly in the rearview mirror or viewed directly.

5. Paragraph S4.4.1 is amended by deleting the period at the end thereof and adding ", and no high-mounted stoplamp shall be combined with any other lamp or reflective device."

6. Paragraph S4.5.4 is amended by adding the following sentence:

S4.5.4 *** The high-mounted stoplamp on each passenger car shall be activated only upon application of the service brakes.

7. The final clause of the first sentence of paragraph S5.1 is revised to read:

S5.1 ***, for stoplamps, tail lamps, and turn signal lamps designed to conform to SAE Standards J586c, J585d/J585e, and J588e, respectively, and for high-mounted stoplamps designed to conform to SAE Recommended Practice J186a, except that Table 1 is replaced by Figure 10.

8. A new Figure 10 is added as follows:

FIGURE 10—MINIMUM DESIGN PHOTOMETRIC REQUIREMENTS FOR CENTER HIGH-MOUNTED STOPLAMPS

Test Points		Red (cd)
100	10L	13
	V	26
	10R	13
5U and 5D	10L	26
	5L	40
	V	40
	5R	40
	10R	26
H	10L	26
	5L	40
	V	40
	5R	40
	10R	26
Maximum		160*

*The lamp shall not exceed the listed maximum over an area larger than that generated by a 1/4 degree radius within a solid cone angle from 10L to 10R and from 10U to 5D.

Issued on October 13, 1983.

Diane K. Steed
Deputy Administrator

48 FR 48235
October 18, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-02; Notice 3)

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: This notice responds to petitions for reconsideration of the October 18, 1983 notice (48 FR 48235) amending Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* to require installation of a single center high-mounted stoplamp on passenger cars manufactured on or after September 1, 1985, in addition to the stoplamps presently required.

In response to petitions from a number of manufacturers, the requirement that the lamp be mounted not higher than the top of the rear window and not lower than 3 inches below it is amended to allow mounting above the rear window and, for convertibles only, not more than 6 inches below it. The notice also makes clear that the lamp can be mounted directly to the glazing. Because of the physical impossibility of eliminating all reflections from interior-mounted lamps shining on the rear window glazing, the agency has amended the requirement that there be no reflections, and returned to the performance level originally proposed, that means be taken to minimize reflections. Although the maximum permissible intensity of 160 candela has been retained, the minimum intensity has been lowered from 40 candela to 25 candela. The minimum lamp area of 4½ square inches has been retained. Lamps that are mounted in the vehicle interior need not meet moisture, dust, or corrosion requirements.

The notice also provides interpretations of questions that were raised by the petitioners and others. The most important of these clarifies the agency's intent that photometrics of an interior-mounted lamp be measured through the glazing as the lamp is installed in the vehicle with the rear window behind it.

EFFECTIVE DATES: September 1, 1985, except September 1, 1986, for termination of the provision permitting center high-mounted stoplamps to flash with hazard warning systems.

SUPPLEMENTARY INFORMATION: On October 18, 1983, NHTSA published a notice amending 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* (48 FR 48235). The amendment requires installation of a single center high-mounted stoplamp on passenger cars manufactured on or after September 1, 1985, in addition to the stoplamps presently required. As adopted, the amendment requires that the lamp must have a light-emitting area of not less than 4½ square inches, produce not less than 40 candela at any point and be mounted on the vehicle's rear vertical centerline no higher than the top of the rear window and no lower than 3 inches below the lower edge of the glazing. If the lamp is mounted in the vehicle's interior, means must be taken to insure that there are no reflections from the rear glazing.

Petitions for reconsideration of the amendment were filed by General Motors, Ford Motor Co., Chrysler Corp., American Motors Corp., Motor Vehicle Manufacturers Association, Volkswagen of America, and Renault USA Inc. Some of these petitioners also raised questions of interpretation. Other requests for interpretation were received from Koito Manufacturing, Ltd., Toyo Kogyo (Mazda), Honda and Nissan Research and Development, Inc. Because these questions are of general interest and applicability, the agency has decided to respond to them in this notice as well. The agency notes that many favorable comments were received from the public at large.

Discussion of Petitions

Mounting location. Paragraph S4.3.1.8 requires in pertinent part that the high-mounted stoplamp be located with its center on the vertical centerline of the vehicle and that "no portion of the lens shall be higher than the top of the back window or lower than three inches below the bottom of the back window". Virtually all petitioners argued that this location was unduly restrictive. Many interpreted the standard as not allowing mounting of the lamp on the glazing itself. Some asked whether a "window" includes that portion of the glazing which may be opaque.

The agency proposed three alternative locations in its NPRM of January 8, 1981 (46 FR 2132) based upon mounting height of the lamp above the road surface, but eventually rejected this approach. The final rule adopted a location relative to the vehicle's back window rather than relative to vehicle height based on its opinion that the adopted approach would afford manufacturers more flexibility in vehicle design. Yet the rule appears to present problems for certain types of vehicle designs such as hatchbacks and station wagons. Several meetings were held between the agency and individual manufacturers who explained the difficulties involved, primarily on vehicles with steeply sloped rooflines and rear window glazing. Chrysler Corporation presented the additional problem of its convertibles where the bottom of the rear glazing is approximately 5 inches above the feasible location for the lamp. There was a general consensus among the petitioners that the agency should allow mounting above the back window, so as to minimize interference with the field of view in the rearview mirror and that by so doing, the integrity of rearward vision could be maintained.

Given the clear need of manufacturers faced with tooling deadlines for a more convenient location, and the agency's desire to remove unnecessary design restrictions, the agency is granting their petitions. Paragraph S4.3.1.8 is being amended to allow mounting on the vertical centerline above the back window. However, to reduce possible problems associated with contrast of lamps mounted above the roof line and to avoid confusion with emergency vehicles, the agency expects manufacturers to mount the lamps as close to the back window as possible. Allowing a minimally higher location of the lamp will preserve the visual cue provided by the system and remove a possible obstruction to rearward vision. In recognition of the rear glazing limitations of convertibles, this paragraph is being further amended to provide that no portion of the lamp lens on convertibles may be more than 6 inches below the window.

In attempting to arrive at a practicable location, some manufacturers asked NHTSA whether the top and bottom of the daylight opening could be considered the top and bottom of the window. Passenger cars, principally ones with sharply sloping rooflines, are beginning to appear with portions of the rear glazing opaque. Opaqueness is intended to reduce the amount of sun entering the passenger compartment. The agency takes this opportunity to clarify that the perimeter of the maximum unobstructed opening through the glazing surface is considered to be the perimeter of the back window. For purposes of this requirement, NHTSA considers opaqueness to constitute an obstruction.

GM petitioned the agency to specify that the center of the high-mounted stoplamp lens instead of its perimeter be the frame of reference for determining compliance with the locational requirements. The agency believes that the relaxation of the locational requirements makes adoption of this change unnecessary. The additional step of adopting the measurement change would have the effect of relaxing the locational requirement even further, an undesirable result in the agency's view.

It was unclear to many commenters that S4.3.1.8 was not intended to preclude mounting on the glazing itself. To clarify that point that mounting to the glazing is permissible, a letter was sent to the petitioners shortly after the close of the comment period and placed in the docket. The agency is amending S4.3.1.8 to reflect that letter.

Nissan asked whether the standard allows mounting of the lamp on deck lids or tail gates. The answer is yes; the agency considers each of these items a "rigid part of the vehicle . . . that is not designed to be removed except for repair" within the meaning of the specification of S4.3.1.

Nissan also asked whether it was permissible to mount the lamp so as to obscure part of the field of view stipulated in paragraph S5.1.1 of Standard No. 111, *Rearview Mirrors.* This paragraph allows the line of sight to be partially obscured only by passengers or head restraints. The agency did not propose to broaden the list of objects which may obscure the line of sight. Therefore, the lamp must be located so as not to interfere with the line of sight. Alternatively, in accordance with S5.3 of Standard No. 111, the vehicle can be equipped with an outside rear view mirror on the passenger side.

Inside reflections. As adopted, paragraph S4.3.1.8 stated that "if the lamp is mounted inside the vehicle, means shall be provided so that no reflections from the light of the lamp upon the rear window glazing shall be visible to the driver when viewed indirectly in the rear view mirror or viewed directly." NHTSA had proposed that the reflections be minimized, and the preamble to the final rule did not discuss why the agency had adopted a more stringent requirement.

Virtually all commenters objected to the elimination of reflections as physically impossible. NHTSA had assumed that mounting the lamp flush with the rear glazing, or with a protective shroud extending from the lamp to the glazing, would be a simple, feasible way to eliminate reflections. Manufacturers demonstrated, however, that the optical qualities of glass are such that not all light passes through the glazing, and that a small portion of it is reflected before it can exit, creating a "halo" effect around the perimeter of even a flush-mounted lamp, or its shroud. Accordingly, the petitioners requested that NHTSA return to the language originally proposed, a minimization of reflections.

NHTSA has carefully considered this issue and the manufacturers' views. Agency personnel have examined vehicles with prototype systems demonstrating that reflections are virtually nonexistent. The manufacturers in turn are more fully aware of NHTSA's concerns after these meetings. The design solution most likely to be adopted is a protective shroud that either contacts or extends very close to the glazing. The combined effect of the shroud location, lamp design and filament location eliminates direct reflection from the surface of the glazing. This is the same solution envisioned by NHTSA when it adopted the requirement that there be "no reflections". Given the literal impossibility of eliminating reflections entirely, NHTSA believes that the same safety goal is achieved by granting the manufacturers' petitions and amending S4.3.1.8 to require that manufacturers "minimize" reflections.

Photometric intensity and test methods. Table III of Standard No. 108 specifies that the intensity of the high-mounted stoplamp at the axis reference H-V and eight other central points shall not be less than 40, nor more than 160 candela at any test point. The NPRM had proposed a minimum of 15 and a maximum of 60 candela.

The majority of the petitioners objected to the increased photometrics and asked that the values originally proposed be adopted. Two petitioners, General Motors and Ford, conducted demonstrations for the agency with lamps of varying intensity to support their petitions.

The values adopted in the rule were based upon recommendations by five commenters to the NPRM that the new lamp have higher intensities than NHTSA proposed. They were also based upon the results of a study by the Insurance Institute for Highway Safety where a 58% reduction in collisions was achieved using two bulbs, with a maximum of 150 candela. The agency therefore concluded that higher values would ensure better detection during periods of dusk or dawn, or when the lens became dirty.

The demonstrations conducted by GM and Ford using lenses of approximately 4.5 square inch area, indicated to the NHTSA staff that 15 candela might prove too low to be effective during daytime conditions and under certain nighttime conditions on city streets because of the existence of light from many sources both on and off the roadway. These demonstrations, however, showed that a minimum of less than 40 candela appeared adequate for safety. Accordingly, NHTSA grants the petitions for a reduction in the minimum photometrics, to 25 candela and denies those seeking a decrease in the maximum. Figure 10 is amended appropriately.

General Motors believes that there is a need to specify intensity requirements for center high-mounted stoplamps with two or three compartments, to ensure that the brightness of the signal is not diminished if lamps are produced with lens areas substantially in excess of the minimum required. Motor Vehicle Manufacturers Association echoed this concern. It was also suggested that zones be established to group test points, as have been established for certain other lighting devices.

Under the existing rule, manufacturers are not precluded from offering multi-compartment or multi-bulb lamps. Because comments were not sought on intensities for multi-compartment or multi-bulb lamps, or for grouping of test points in zones, these subjects are considered not within the scope of the proposal and the rule, and the petitions regarding them are denied.

At present, most manufacturers have indicated that they will attempt to make the initial lamp as small as possible. The single compartment lamps likely to appear should therefore have adequate visibility. However, the converse could present a problem as well, where maximum intensity is emitted through minimum lens area. Should this occur, and create the potential for glare, the agency may move to institute rulemaking to ameliorate it. In the meantime, NHTSA encourages manufacturers to adopt intensity values commensurate with the amount of lens area provided. For example, 100 candela as measured outside the vehicle appears appropriate as the maximum value for a single-compartment lamp with the minimum required area of 4½ square inches and values above 100 candela could be used in designs embodying large lens areas and for multiple bulbs and compartments.

The agency received several requests for an interpretation whether photometrics of interior mounted lamps were to be measured through the glazing. NHTSA wishes to provide the clarification that photometrics are to be measured as if the light were mounted on the vehicle, and if the location is inside the passenger compartment, the agency's determination of compliance will be made by measuring photometrics with the glazing in place.

Paragraph S4.1.1.41(b) requires that the signal be "visible to the rear through a horizontal angle from 45 degrees to the left to 45 degrees to the right. . . .", Koito asked what the agency considered "visible". This appears especially important for the design of the shroud on interior mounted lamps. In the agency's opinion, the lamp must meet the test points specified in Figure 10 up to the maximum specified 10 degrees right and left. Beyond those points, until 45 degrees right and left, no requirements are established other than that the signal be "visible", which means any portion of the signal, without regard to lens area or candela.

Mazda asked whether the lamp could be tested with a rear window wiping system in the off mode. The agency will test a vehicle with all its standard and optional equipment, including rear wiping/washing systems, in the design off position. The agency emphasizes that the existence of such equipment does not affect the necessity of complying with the photometric requirements. Notwithstanding such equipment, the lamp must be positioned in such a way that it will comply when tested at any of the photometric test points specified in the standard.

Minimum area. GM asked that the minimum required area of the lamp be reduced to 3 square inches, believing that is sufficient to achieve the safety purpose for which it has been mandated. GM demonstrated a lamp of this nature to the agency, but to observers it appeared insufficient to provide a readily identifiable stopping cue under many road and environmental conditions. Lamps no smaller than the minimum 4½ square inches adopted were used in the research supporting this rule, and the agency has concluded that the minimum area should not be changed. Accordingly, GM's petition is denied.

Effective date. Ford and Chrysler petitioned that the effective date be delayed for a year; American Motors asked for six months. GM asked that the effective date be accelerated with compliance optional before September 1, 1985.

NHTSA considers it in the public interest that the new safety device should be introduced at the earliest feasible moment. To assist compliance by September 1, 1985, it has granted petitions affecting mounting location and intensity. This positive action on NHTSA's part should reduce the lead time required to tool the lamp and vehicles, and ensure that the September 1, 1985 effective date is met. The petitions for a delay in effective date are therefore denied.

GM wishes to introduce high mounted stop lamps on some models before the September 1, 1985 effective date. Accordingly, GM requested that NHTSA specify that the lamp may be introduced before the effective date, so that any State laws that might prohibit the lamp's early introduction would be preempted. The only known example at the time was California's prohibition against interior mounting on any stop lamp. A bill has been signed by the Governor of California which removes this impediment, but which adopts language similar to that contained in NHTSA's original final rule prohibiting any reflections from the lamp. Because NHTSA relaxed this prohibition elsewhere in this notice, preemption would still be necessary. For this reason, and in the event there may be unknown issues of preemption, NHTSA in a companion notice is proposing to amend the standard to allow use of the lamp on 1985 models. (49 FR ________).

Because of the way their vehicles are currently wired, both Ford and GM asked the agency to allow the high-mounted lamp to flash when the hazard warning lamps flash. To encourage an early introduction of the system and to minimize costs, the agency has decided to permit the stop lamp to flash with the hazard warning lights until September 1, 1986. The longer lead time allowed should enable manufacturers to rewire their products at minimal costs.

Test pattern. The applicable SAE requirements incorporated by reference for center high-mounted stoplamps are those of Recommended Practice J186a, September 1977. Five of the photometric test points involve measurements at test point 5D (5 degrees down, or below horizontal). GM states that there may be some current vehicle configurations and mounting locations where these test points would not be visible. This could exist when a lamp is mounted at the bottom of the glazing, and a spoiler or luggage rack is mounted on the deck lid. It therefore requested an amendment to the standard that these test points need not be met if the lamp "is visible at a point 10 feet from its lens and 35.5 inches above ground but is not visible at the 5 degree down test point". Ford asked for similar relief. Lately, a supplier of deck mounted luggage racks has told NHTSA that its business has been directly affected because of a presumed inability of some future vehicles to meet this requirement with the rack in place. However, the added flexibility in lamp location provided in this amendment should ameliorate this potential problem.

The agency has decided to deny petitions asking relief from this requirement. Such an amendment, as NHTSA interprets it, would eliminate all photometric requirements below the horizontal for all vehicles whose high-mounted lamps were mounted less than 46 inches from the ground. Visibility of the lamp from this angle could be important for viewing vehicles from the rear when coming over a hill. The agency has reduced its restrictions regarding mounting location, and if a lamp mounted in the lowest permissible position would not meet the 5 degree test points, the lamp could be located to a higher height where the requirement may be met.

Further, the photometric requirements do not specify that the entire lens must be visible from each 5 degree down test point. Instead, they specify the intensity of light that must be visible from those points. Therefore, the requirement can be met with a lamp whose lens is partially obscured by a portion of the vehicle when viewed from some of the test points.

Environmental tests. Chrysler and others asked whether there is a need to apply moisture, dust, and corrosion requirements to lamps which are located inside the vehicle. The agency agrees with the argument that these lamps will not be subject to extremes of moisture, dust, and corrosion by virtue of their interior location and therefore need not meet these requirements. NHTSA is granting these petitions by amending the standard accordingly.

Minor amendments. The notice also amends the standard in minor respects. An outdated reference to a no longer effective "Figure 3" is deleted. Exceptions from compliance with J186a have been removed from Table III and paragraph S5.1 and placed more appropriately in S4.1.1.38. A typographical error in Figure 10 shows test position "50L". The correct number is "5L" and the amended Figure 10 reflects the change.

Miscellaneous comments and interpretations. Several commenters pointed out that the center high-mounted stop lamp is currently not permitted in certain European countries and that its adoption is a step away from the goal of international harmonization. The practical effect of this is that U.S. vehicles manufactured after September 1, 1985, and intended for sale in Europe would have to be modified before sale, with the converse also being true of European cars manufactured for sale here.

While one of the agency's goals is to further international harmonization, NHTSA will not sacrifice safety benefits to achieve it. The agency will work within Working Party 29 of the United

Nation's Economic Commission of Europe to achieve harmonization on this issue.

The question was asked whether the "center" of the lamp is its geometric center, its optical center (reference center at photometric measurement) or the center of the bulb filament. The center of the lamp, in the agency's meaning, is the geometric center.

Issued on May 11, 1984.

Diane K. Steed
Administrator

49 F.R. 20818
May 17, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment
[Docket No. 81-02; Notice 6]

ACTION: Final rule; Response to petition for reconsideration.

SUMMARY: On May 17, 1984 (49 FR 20879) NHTSA proposed to amend FMVSS 108 to allow use of center high mounted stop lamps beginning September 1, 1984, requiring conformance only with location and reflection minimization requirements. That action was taken pursuant to a request by General Motors Corporation that NHTSA specify that the lamp may be installed before the effective date of September 1, 1985. Adoption of an optional compliance date would preempt any State laws that might prohibit the lamp's early introduction. This Notice amends Standard No. 108 to allow installation of the lamp effective August 1, 1984. The agency anticipates that this action will promote early achievement of the safety benefits associated with the addition of center high-mounted stop lamps. This notice also responds to a petition for reconsideration of the amendments to Federal Motor Vehicle Safety Standard No. 108 published on May 17, 1984 (49 FR 20818).

EFFECTIVE DATE: For voluntarily installing center high-mounted stop lamps and for location and reflection minimization requirements for those devices: August 1, 1984.

SUPPLEMENTARY INFORMATION: In its petition for reconsideration of NHTSA's final rule establishing requirements for a center high-mounted stop lamp on passenger cars manufactured on or after September 1, 1985, (see 48 FR 48235, October 18, 1983) General Motors requested that NHTSA amend Standard No. 108 to specify that the lamp may be introduced before the effective date. The purpose of this request was to obtain earlier preemption of any State laws that might prohibit the lamp's early introduction. On May 17, 1984, NHTSA responded to GM's request (49 FR 20879) and proposed to allow (but not require) early introduction of the stop lamp. Only requirements regarding lamp location and minimization of reflections would be applicable to cars manufactured with center high-mounted stop lamps between September 1, 1984, and September 1, 1985.

Comments on the proposal were received from Chrysler Corporation, Ford Motor Company, Volkswagen of America, General Motors, and Parker Hannifin Corporation. All commenters concurred with the proposal. Ford and General Motor recommended that the final rule be effective upon its publication in the *Federal Register*. GM further commented that the proposal "did not address the after market package which General Motors had intended to make available through our dealers, since it only speaks of passenger cars manufactured between September 1, 1984 and September 1, 1985."

The agency agrees that an effective date as early as practicable is in the public interest, and, in accordance with the proposal and the comments of GM and Ford, has designated August 1, 1984, as that date. Because the vehicle certification attached pursuant to 49 CFR Part 567 requires only the month and year of manufacture, generally the agency sets an effective date for new vehicle requirements as of the first day of a month so that a manufacturer will not have to certify to differing requirements within a single month. An effective date as of the first of the month also assists the agency in its compliance efforts. NHTSA does not understand that any 1985 model vehicles equipped with the lamp will be manufactured before August 1, 1984, and consequently found no reason to adopt an effective date earlier than that date.

The agency was not aware that GM had intended to offer an aftermarket package until receiving its comment. Such an amendment would be outside the scope of the proposal, and accordingly, was not considered. Under paragraph S4.7.1, the standard covers the aftermarket only to the extent that GM (or any manufacturer) offers a lamp intended as replacement for an original equipment center high-mounted stop lamp. However, to encourage retrofit in the aftermarket, NHTSA will study GM's request and consider whatever legal action may be required to remove impediments to the lamp's use.

Parker Hannifin Corporation, manufacturer of Ideal turn signal and hazard warning signal flashers, petitioned for reconsideration of the amendment to FMVSS No. 108 published on May 17, 1984 (49 FR 20818), which was based upon the original petitions for reconsideration of the final rule requiring center mounted stop lamps. Specifically, Parker Hannifin objected to new paragraph S4.6(b) which stated that "high-mounted stop lamps on passenger cars manufactured on or after September 1, 1985, but before September 1, 1986, may flash when the hazard warning system is activated". In the commenter's opinion, the agency had given no prior notice "to this function", and stated that the agency's action will "create a chaotic condition in the automotive flasher industry." The company avers that an insufficient period of time exists "for the development of a 'due care' basis for certification of hazard warning flashers rated for seven (7) lamps for conformance to FMVSS 108". The existing basis for certification of conformance of thermal flashers is said to be "up to six (6) lamps". Parker Hannifin recommended that the agency prohibit the additional lamp from flashing, or rule that certification for flashers can exclude the center high-mounted stop lamp. In its opinion, the agency's action is the very type of substantive rulemaking without notice which the Third Circuit found objectionable in *Wagner Electric Corp. v. Volpe* (466 F.2d 1013 (3rd. Cir. 1972).

Parker Hannifin's belief that the provision allowing flashing was adopted without notice overlooks the circumstances under which the center high mounted stop lamp was made subject to a prohibition against flashing. Although the preamble to the proposed rule did not raise the issue and the commenters did not address it, the specific text of the amendment, taken in context with the other requirements of the standard, required the center high mounted stop lamp to be steady-burning. However, the agency recognizes that it was a reasonable reading of the proposal for the commenters to believe that the light could be flashing. Thus, in order to avoid imposing a burden on vehicle manufacturers due to their interpretation, the May 1984 amendment allowed the lights to flash on vehicles manufactured before September 1, 1986.

The factual situation differs greatly from that of *Wagner*. Before the amendment complained of by Wagner, flashers were required to be "designed to conform" to Standard No. 108, but the burden of certification was upon vehicle manufacturers as aftermarket equipment was not covered until January 1, 1972. NHTSA amended the standard without sufficient notice to apply it to all flashers, for whatever purpose manufactured, thus placing the certification responsibility entirely upon flasher manufacturers. Further, the flashers were required to "conform", not merely be "designed to conform". In the instant case, the effect upon flasher manufacturers is a remote one. In order to facilitate early adoption of a safety device with demonstrable public benefits, at a minimum cost, the agency has allowed vehicle manufacturers to continue to use existing wiring systems for a limited time, if they so choose. There is no requirement that the new lamp flash when the hazard warning signals do, there has been no change to existing Federal or SAE materials applicable to flashers, and given the perceived limited use of the new lamp during 1985 model production, there would appear to be minimal impact upon original equipment and aftermarket requirements for flashers of existing designs. Nor can NHTSA provide an interpretation that certification for flashers may exclude the center mounted lamp. That permission is already implicitly contained in Standard No. 108 which allows the manufacturer to specify the design load at which its flasher is intended to operate. Accordingly the agency has decided to deny parker Hannifin's petition.

NHTSA has considered the potential impacts of this rule and has determined that the rule is neither major within the meaning of Executive Order 12291 nor significant within the meaning of the Department of Transportation guidelines. The conclusions in the original regulatory evaluation for the final rule are not affected by the adoption of this rule. A free copy of that evaluation is available from the Docket Section.

The agency has also considered the impacts of these amendments under the Regulatory Flexibility Act. I certify that these amendments will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles, those businesses affected by this amendment, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Small organizations and governmental units which purchase cars equipped with center high-mounted stop lamps will not be significantly affected. The increase in new car prices for vehicles manufactured by companies which opt for early compliance will be negligible.

Because motor vehicle manufacturers must make timely decisions with respect to plans for the 1985 model year and because this amendment will facilitate the early introduction of a safety device, the agency finds that an effective date, earlier than 180 days after issuance of the final rule, is in the public interest. The change adopted in this notice relieves restrictions. Additional notice and comment on the August 1, 1984 early compliance date is unnecessary because of the minor nature of the change from the proposal.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, is amended as follows:

1. A new paragraph S4.1.1.42 is added to read:

S.1.1.42 A passenger car manufactured between August 1, 1984, and September 1, 1985, may be equipped with a high-mounted stop lamp that conforms to S4.3.1.8.

2. Subparagraph (b) of paragraph S4.6 is amended by changing the date "September 1, 1985" to "August 1, 1984".

Issued on August 24, 1984.

Diane K. Steed
Administrator

49 FR 34488
August 31, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

[Docket No. 81-11; Notice 8]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend the corrosion test requirements and procedures in Motor Vehicle Safety Standard No. 108 applicable to semi-sealed replaceable bulb headlamps and lens/reflector components of such headlamps.

The bulb removal corrosion test adopted in this notice was proposed on September 30, 1983 (48 FR 44866). In essence, it requires that the bulb be removed from the lamp and the test chamber at the end of the required 23-hour period of exposure to salt spray, for the final hour of eight of the ten 24-hour test cycles. This notice also adds motorcycles to the categories of vehicles allowed to be equipped with semi-sealed replaceable bulb headlamps. A revised bulb connector test is also adopted herein.

EFFECTIVE DATE: December 13, 1984.

SUPPLEMENTARY INFORMATION: On January 17, 1983, NHTSA proposed the adoption of a new type of headlamp system, a semi-sealed unit comprising a bonded lens/reflector and a standardized replaceable light source (48 FR 1992). To insure that the new lamps offered durability of photometrics equivalent to sealed beam systems, NHTSA proposed that the new lamps conform to certain requirements after being subjected to a battery of environmental tests.

One of the most important of these tests was intended to demonstrate resistance of the lamp to corrosion, as the agency was aware of the vulnerability of non-sealed composite headlamps to moisture. One of the reasons the agency never allowed European headlights was their lack of corrosion resistance. The ECE standard does not assure that a high level of reflector corrosion resistance is provided. German vehicle inspection data showed significant rejections due to dull, corroded and damaged headlamp reflectors. Thus, a good corrosion test for reflectors was needed—particularly since replacement lamps which include reflectors will be sold as aftermarket items. Because of this concern about corrosion resistance of the reflector, NHTSA originally requested that Ford propose a test for corrosion resistance immediately after receipt of its petition. Ford responded by proposing a 48-hour test, based on the requirements of SAE J575 June 1980 which is intended for other automotive lighting equipment. Ford later suggested a 240-hour test that was contained in a draft of a proposed SAE standard, XJ1383. The ASTM procedure (B-117-73) referred to in the proposed SAE standard is a standard method of salt spray (fog) testing, applicable to testing of ferrous and non-ferrous metals. It is also used to test inorganic and organic coatings, etc., especially where such tests are the basis for material or product specifications. Ford, which originally proposed the test in XJ1383, stated that the 240-hour period was developed with the SAE Lighting Committee to establish a minimum level of performance of a lamp exposed to typical corrosive environments encountered in the United States. The test is nearly five times longer than is now used for lighting devices. The 240-hour period is intended to simulate a level of exposure at least equivalent to that experienced during the service life of the vehicle. According to Ford, this 240-hour test is expected to detect the problems of corrosion of headlamp elements that have been a source of complaint with older European style headlamps.

Therefore, in January 1983 NHTSA proposed that the headlamp be subjected to ten 24-hour cycles of a salt spray test in which the salt spray would be activated for the first 23 hours and deactivated the 24th. At the conclusion of the test, the headlamp was to have met the photometric requirements of Standard No. 108 with no evidence of external or internal corrosion or rust. Loss of adhesion of any applied coating was not permitted more than .125 inch (3.2 mm) from any sharp edges on the inside or outside. Corrosion could occur on terminals provided there was no loss of function.

On the basis of comments, NHTSA adopted a corrosion test modified in both major and minor respects (June 2, 1983, 48 FR 24690). Corrosion was not to be visible "without magnification." Corrosion could occur on terminals "provided there is no voltage drop greater than 3 percent from that measured before the test when measured per paragraph 6.4 of SAE J580 August 1979." The major change, however, was to specify that during the hour of salt spray deactivation in each cycle the bulb was to be removed. NHTSA viewed this as a necessary change to assure adequate reflector corrosion resistance, even though it was an accelerated test. The corresponding introduction of a salt atmosphere on the inside of the lamp could create excessive salt deposits not easily removed, so NHTSA did not require that the lamp demonstrate photometric conformance.

The agency received petitions for reconsideration on various requirements of the corrosion test from Ford, Volkswagen of America, and Westfallische Metall Industrie, manufacturer of Hella lamps. Ford objected to the introduction of the voltage drop limitation on the bulb and connector, stating that it had not been proposed in the NPRM or suggested by any commenter. Ford further objected that the requirement was impracticable and unreasonable and that it appeared that the agency intended to specify 3% of the lamp's design voltage. The two other petitioners objected to the specification that the bulb be removed during the final hour of the cycle, on the basis that the requirement had not been proposed and that the test was not representative of real world conditions. The agency agreed that the connector voltage drop test should specify current drop in a fixed test setup and such a test would be adopted and it would delete reference to paragraph S6.4 of SAE J580, August 1979, to avoid confusion. To remove any question about adequacy of notice, the agency on September 30, 1983, amended paragraphs S4.1.1.36(d)(4) and S6.5 to adopt the corrosion test as originally proposed in January 1983, along with the photometric test (48 FR 44818). At the same time it published a notice of proposed rulemaking (48 FR 44866) covering the corrosion test as adopted on June 2, 1983.

Under the September 1983 NPRM, the test would be applicable to all replaceable bulb headlamps and replacement lens-reflector assemblies, and was a modified version of the one objected to by petitioners for reconsideration. With a connector attached to the terminals, the lamp would undergo the ten consecutive 24-hour cycle salt spray test, with the bulb removed for the final hour of each cycle when the spray was deactivated. The lamp would then be rinsed with deionized water and allowed to dry. The strictures against corrosion would remain, and could occur on terminals provided that the current did not decreased more than 3% compared to pretest conditions when using a test set up not identical but similar to Figure 1 in SAE J580, August 1979 and as further detailed in the proposed rule. The power source would be set to provide 12.8 volts and the resistance would be set to produce 10 amperes of current for pretest conditions.

The agency proposed the accelerated test which includes bulb removal as a reasonable way of judging resistance of the reflector to degradation caused by oxygen and moisture which are always present in the atmosphere. It is not an impracticable test; one European headlamp manufacturer, Robert Bosch, had informed NHTSA that certain of its headlamps with metal reflectors already met the standard as adopted in June 1983. In addition, the agency tested the replaceable bulb headlamp used by Ford which has a plastic reflector; it met the requirements with 10 bulb removals in a 240-hour period. The agency did receive conflicting data on the ability of various headlamps to pass the bulb removal corrosion test, but with its own tests and the data furnished by Bosch, the agency concluded that the proposed requirement would be practicable and reasonable for both metal and plastic reflector headlamps.

Finally, in line with SAE J584 and paragraph S4.1.1.34 which, in essence, allow a motorcycle to be equipped with passenger car headlighting equipment, NHTSA proposed that a motorcycle may be equipped with one or two replaceable bulb headlamps meeting all the requirements of the standard.

Comments were received, principally, from Ford Motor Company, Robert Bosch Corporation, Volkswagen of America, and General Motors Corporation. In addition, comments from Sylvania on a rulemaking petition submitted by Volkswagen to allow use of H-4 bulbs, stated that environmental tests for reflector integrity are important to lamp performance and should not be compromised.

Robert Bosch confirmed that it had run extensive tests on its lamps, and that it could meet the proposed corrosion test. In Ford's view, reflector corrosion resistance could be adequately judged by removing the bulb at the end of the first two 24-hour cycles only. It pointed out that a modification of this nature would eliminate the cost concerned with weekend overtime which would be required if the bulb had to be removed during each day of the 10-day test. Hella recommended that the bulb be allowed to remain installed for two cycles. GM recommended that the entire assembly be tested for 240 hours of continuous salt spray. VW recommended that the corrosion test not be amended, but it also presented modifications to simplify weekend scheduling problems. It suggested three alternatives to the proposal: a 5-day test, a reduction in bulb removal from 10 cycles to 8, and a variation in the 10-day cycle under which the bulb could remain out for more than one hour, and in for more than 23 hours. The agency reviewed these comments carefully and has decided to adopted VW and Hella's suggestion that the bulb be allowed to remain in the lamp for 2 of the 10 cycles, in order to accommodate weekend scheduling programs and to programs and to eliminate overtime. Although this requirement is slightly less severe than proposed, based on the agency's successful testing of a current production Mark VII headlamp at 10 cycles NHTSA has concluded that the results at 8 cycles should not differ greatly. To increase objectivity and repeatability, however, the amendment limits the periods of nonremoval to the manufacturer's choice of any two periods at the end of the fourth through seventh cycles; bulb removal is specified for the first three and final three cycles. The agency is interested in being flexible in this regard without reducing the objective of the standard.

GM recommended that the entire assembly be tested for 240 hours of continuous salt spray and that afterwards there would be no evidence of corrosion that would result in failure of any other test specified for replaceable bulb headlamps, such as photometrics.

GM appears to have misinterpreted this section since the test applies to the headlamp but not to mounting and aiming hardware. In any event, the bulb removal has no effect on this aspect of performance. GM provided no substantiation for its opinion that a variability of the composition of the salt spray will have a measurable effect on lamp performance. NHTSA has dealt with this concern by restricting the location of the lamp within the cabinet, and by specifying the amount of time that the cabinet can be open. In accordance with GM's comments, language is adopted that the headlamp is mounted in the middle of the test chamber to provide a more uniform exposure of the test sample, even though sizes of test chambers may differ. Further, language is added clarifying that the bulb is removed from the test chamber during the hour of salt spray deactivation. Finally, 2 minutes is now specified as the maximum that the chamber may be opened during bulb removal or replacement.

The proposal from Ford for a change in the language of the electrical connector test has been adopted.

No comments were received on the proposal that motorcycles be added to the categories of vehicles allowed to use Standard No. 108's replaceable bulb headlighting system, and the standard is amended as proposed.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291, "Federal Regulation," or significant under Department of Transportation regulatory policies and procedures, as its adoption does not require any person to change current practices under the standard. A regulatory evaluation was prepared for the amendment adopted on June 2, 1983, and placed in the docket. (A free copy of this document can be obtained from the Docket Section.) It is considered fully relevant for purposes of this rule.

NHTSA has concluded that this rule will not have a significant impact on the human environment. The lamps that will be manufactured pursuant to the rule are expected to be lighter, thus slightly reducing the overall material content of the automobile. This would have a small positive effect on the environment. No adverse impact on safety is anticipated.

The agency has also considered the impacts of this rule under the Regulatory Flexibility Act. I certify that this rule will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles and headlamps, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Further, these manufacturers would be affected only to the extent that they elected to take advantage of the new headlighting option that is amended by the rule. The number of different components in the inventories of headlamp distributors will increase, but not to the extent that any significant problem will be created. Finally, small organizations and governmental jurisdictions would be affected only to the extent that they choose to buy vehicles equipped with the new headlamps. The organization and jurisdictions making that choice would not be significantly affected by the price of the new headlamps.

The agency believes that existing headlamp bulbs and plastic reflectors can meet the requirement. Additional coats of lacquer on reflectors are an approach to improving corrosion resistance. The cost of lacquer coatings appears to be low. The agency therefore does not anticipate a significant cost impact as a result of this requirement.

Because of the criticality of reflector integrity to headlamp performance and the relationship of the corrosion test to it, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest. Accordingly, the amendment is effective 30 days after publication in the FEDERAL REGISTER.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

1. S4.1.1.36 is revised to read:

S4.1.1.36 Instead of being equipped with a headlighting system specified in Table I or Table III, a passenger car, multipurpose passenger vehicle, truck, bus, or motorcycle manufactured on or after July 1, 1983, may be equipped with a system of one or two replaceable bulb headlamps, if the vehicle is a motorcycle, or two replaceable bulb headlamps, if the vehicle is a passenger car, multipurpose passenger vehicle, truck, or bus, designed to conform to the following requirements.

2. S4.1.1.36(d)(4) is revised to read:

(4) After a corrosion test conducted in accordance with S6.5, there shall be no evidence of external or internal corrosion or rust visible without magnification. Loss of adhesion of any applied coating shall not occur more than 0.125 in (3.2 mm) from any sharp edge on the inside or outside. Corrosion may occur on terminals only if the current produced during the test of paragraph S6.5(c) is not less than 9.7 amperes.

3. S6.1 is amended to delete "S6.5".

4. S6.5 is revised to read:

S6.5 *Corrosion.* (a) A connector test shall be performed on each filament circuit prior to the test in subparagraph (b) according to Figure 1 of SAE Standard J580, August 1979. The power source shall be set to provide 12.8 volts and the resistance shall be set to produce 10 amperes.

(b) The headlamp with connector attached to the terminals, unfixtured and in its designed operating attitude with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be subjected to a salt spray (fog) test in accordance with ASTM B117-73, "Method of Salt Spray (FOG) Testing," for a period of 240 hours, consisting of ten successive 24-hour intervals. During each interval, the headlamp shall be mounted in the middle of the chamber and exposed for 23 hours to the salt spray. The spray shall not be activated for the 24th hour. The bulb shall be removed from the headlamp and from the test chamber during the one hour of salt spray deactivation and reinserted for the start of the next test cycle, at the end of the first and last three 23-hour periods of salt spray exposure, and at the end of any two of the fourth through seventh 23 hour periods of salt-spray exposure. The test chamber shall be closed at all times except for a maximum of two minutes which is allowed for removal or replacement of a bulb during each cycle. After the ten cycles, the lens reflector unit without the bulb shall be immersed in deionized water for five minutes, then secured and allowed to dry by natural convection only.

(c) Using the voltage, resistance and pretest setup of subparagraph (a), the current in each filament circuit shall be measured after the test conducted in subparagraph (b).

Issued on November 6, 1984.

Diane K. Steed
Administrator

49 FR 44899
November 13, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards: Lamps, Reflective Devices, and Associated Equipment

[Docket No. 81-11; Notice 9]

ACTION: Response to petition for reconsideration.

SUMMARY: On November 13, 1984 (49 FR 44899), NHTSA amended Motor Vehicle Safety Standard No. 108 to alter the corrosion test requirements and procedures applicable to semi sealed replaceable bulb headlamps and lens/reflector components of such headlamps. The amendment was to become effective 30 days after publication in the Federal Register, i.e., December 13, 1984. Volkswagen of America, Inc., and its associated companies petitioned for reconsideration of the effective date to delay it until September 1, 1985, alleging insufficient time for revised certification procedures and modification if required. NHTSA has granted this petition and adopted a new effective date of September 1, 1985, to accord with manufacturer model-year practices and to alleviate any potential hardship to manufacturers of vehicles with replaceable bulb headlamps. Given the limited use of these headlamps in 1985 model cars, the existing test continues to meet the need for motor vehicle safety for the remainder of the model years.

EFFECTIVE DATE: September 1, 1985.

ADDRESS: Petitions for Reconsideration should refer to the docket number and notice number and be submitted to: Administrator, National Highway Traffic Safety Administration, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT: Jere Medlin, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590, (202) 426-2720.

SUPPLEMENTARY INFORMATION: The purpose of this notice is to postpone the effective date of the amended corrosion-test requirements and procedures applicable to semi-sealed replaceable bulb headlamps and lens/reflector components of such headlamps. These were adopted on November 13, 1984, with an effective date of December 13, 1984.

Under the test currently in effect, a replaceable bulb headlamp is tested for corrosion in a salt spray chamber with the bulb inserted at all times. Under the amendment adopted on November 13, 1984, effective December 13, 1984, the bulb is removed for the final hour of eight of the ten 24-hour test cycles, thereby exposing the interior of the lamp to the corrosive influence of the salt spray in the test chamber. On November 15, 1984, Volkswagen of America on behalf of itself, Volkswagen AG, and Audi NSU Auto Union AG petitioned for a delay in the effective date of the requirements to September 1, 1985. Its reasons were as follows. First, NHTSA has generally reserved short-time compliance schedules for relaxation of rules or optional procedures. Though installation of semi sealed headlamps is optional, those who are committed to using this technology for the 1985-model year must meet new requirements with an extremely short lead time. Second, petitioner anticipated that the final rule was to have become effective with a long enough lead time for vendor contact and certification testing to the new corrosion-resistance requirements. Finally, the petitioner notes that the imposition of new requirements in the middle of a model year is highly unusual action for the agency to take, and that "it is clearly impossible for a manufacturer to complete all of the tests and judgments necessary in a mere 30 days and to replace or modify designs without halting production on an entire model line."

The agency reviewed Volkswagen's arguments. Because of the criticality of reflector integrity to headlamp performance and the relationship of corrosion tests to it, the agency had found initially that an early effective date was in the public interest. The agency was unaware that an early effective date might have an adverse economic effect. It wishes to lessen the economic impact that an early implementation of the amendment would have in the course of the 1985 model year. The use of semi sealed headlamps in the 1985 model year is not extensive, and the test that is currently specified in Standard No. 108 is deemed sufficient for motor vehicle safety, given the limited application of the new headlighting systems. Accordingly, the agency has granted Volkswagen's petition.

In consideration of the foregoing, the effective date of the amendments to paragraphs S4.1.1.36, S4.1.1.36(d)(4), S6.1, and S6.5 made at 49 FR 44901 is changed from December 13, 1984, to September 1, 1985.

Issued on November 28, 1984.

Howard M. Smolkin
Acting Administrator

49 F.R. 47396
December 4, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment

[Docket No. 83-12; Notice 2]

ACTION: Final rule.

SUMMARY: This rule adopts changes in rear yellow turn-signal photometrics, license plate lamp requirements, minimum headlamp mounting heights, and test grids for stop, turn, parking, and tail lamps. The primary purpose of the amendments is to bring the requirements in Federal Motor Vehicle Safety Standard No. 108 closer to those of the Economic Commission for Europe of the United Nations (ECE). The amendments will permit cost savings without adversely affecting safety. A notice of proposed rulemaking on this subject was published on August 1, 1983.

EFFECTIVE DATE: December 26, 1984.

SUPPLEMENTARY INFORMATION: The Trade Agreements Act of 1979 (Pub. L. 96-39) imposes certain obligations upon the United States. Under Title IV, Technical Barriers to Trade (Standards), Federal agencies may not engage in any standards-related activity that creates unnecessary obstacles to the foreign commerce of the United States. Agencies shall, in developing standards, take into consideration international standards and shall, if appropriate, base the standards on international standards unless it is not appropriate for safety (19 U.S.C. 2532(2)(B)(i)).

Differences exist between Federal Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* and many of the requirements of the ECE. Some of these differences could be removed or lessened without any adverse effect on traffic safety. This would relieve both American and European vehicle manufacturers of some extra cost of designing and building vehicles for sale both in this country and Europe. It could also provide an opportunity to increase safety. Accordingly, as contemplated by the Trade Agreements Act, NHTSA proposed on August 1, 1983, several amendments to Standard No. 108 to bring its requirements closer to those of the ECE (48 FR 34784).

The first change proposed was a lower minimum value for the photometrics in yellow rear turn-signal lamps. The current Federal requirement is for a minimum of 200 candela (cd) and a maximum of 750 cd; by contrast, the minimum in ECE Regulation No. 6 is 40 cd and the maximum is 200 cd. During a meeting of The Brussels Working Group of Europe (GTB), it was recommended that the United States lower its minimum to 130 cd and that ECE raise its maximum to 350 cd. Tests conducted by the SAE have shown that a value of 130 cd for a yellow lamp is as effective as a rear red turn-signal lamp (lamps of both colors are allowed by Standard No. 108) with an output of 80 cd. Standard No. 108 specifies a minimum of 80 cd for rear red turn signals. Since this value has been adequate for motor vehicle safety, NHTSA believes that the proposed value of 130 cd for yellow rear turn signals would not have an adverse effect on safety.

It appears also that the differing ECE and U.S. requirements for license-plate lamps might be easily harmonized by adopting the latest SAE referenced standard on this item of equipment. Currently, Standard No. 108 specifies the physical and photometric relationship between the lamp or lamps, the plate and its holder but does not specify the point of measurement establishing the relationship. A similar requirement is contained in ECE Regulation No. 4, except that a specific point of measurement is included. SAE Standard J587f, "License Plate Lamps (Rear Registration Plate Lamps)," which was revised in 1981, clarifies the point of measurement of the incident light upon the plate in a manner identical to that of the ECE requirement. NHTSA therefore proposed the incorporation of the revised version of J587 into Standard No. 108.

NHTSA also proposed a reconciliation of differences in the minimum mounting height of headlamps. Standard No. 108 does not allow headlamps to be lower than 24 inches, measured from the road surface to the center of the lamp. The corresponding requirement in ECE Regulation No. 48 is 500 mm (19.7 inches) measured from the ground to the lower edge of the illuminating surface of the lamp. NHTSA proposed a harmonizing value of 22 inches, measured from the road surface to the center of the lamp, except that the distance from the ground to the lower edge of the illuminating surface of the lamp shall not be less than 19.7 inches.

The preamble to the proposal commented that there had been several studies of the effects that changes in mounting height have on seeing distances. The results from one of these studies suggested that mounting height has essentially no effect on seeing distance. The study presented the results from a series of experiments conducted by General Motors. The experiments consisted of asking observers to count the number of simulated pedestrians that were visible using a variety of headlamp configurations. The configurations differed on the basis of the type of headlamp and mounting height.

The results from another study, however, suggested that mounting height has a more definite effect on seeing distance. This study reported on a series of experiments performed by General Electric. In those experiments, the observers were riding in an automobile traveling at 40 mph. The observers were instructed to signal when they could see a target resting by the side of the road. The time of the signal and the speed of the automobile were used in estimating the distance to the target when it was first seen by the observer.

GE conducted experiments with an experimental headlamp having photometrics differing from most production lamps. These experiments showed a loss in seeing distance, but the GM experiments showed very little difference when the 24-inch height was reduced to as low as 18 inches.

To aid the agency in assessing the issue of seeing distance, the agency requested commenters to discuss the safety implications of this issue and the possible reasons for the conflict between the studies.

NHTSA also proposed certain changes regarding stop, tail, turn signal, and parking lamps in the interests of harmonization. Photometrics today are measured under Standard No. 108 at 27 different test points on stop, tail, turn signal, and parking lamps. If all 27 points equal or exceed the required minimum, the lamp complies. ECE Regulation No. 7 also measures light output at discrete test points, the principal difference being that there are only 19 test points. There are fewer intermediate test points in the European method. NHTSA believes that the eight test points in question could be deleted as sharp discontinuous changes in candlepower output across a lens surface do not occur in practice.

Alternatively, the 27 test points are separated under Standard No. 108 into 7 groups or "zones" and minima are established for each zone. If photometrics at a test point fall below the minimum, the lamp will nevertheless comply if the overall reading for the zone equals or exceeds the minimum value required for that zone.

When using the pattern of seven zones that is currently specified in Standard No. 108, with the 19 test points that were proposed, two zones have only a single point and two other zones have only two points. This small number of points in a zone tends to reduce the value of allowing an average over several points in lieu of meeting the minimum at each point. To avoid this difficulty, NHTSA proposed that only five zones be used. These five zones, using 19 points, and a corresponding table of values for each zone, expressed as a sum of the percentages of the minimum value at H-V, are presented in proposed Figure 1c. This change in the pattern of zones is necessary when the number of test points is changed from 27 to 19.

There is also a difference in the method of presentation of the distribution of minimum values over the surface of the lamp which NHTSA also proposed to harmonize. In Standard No. 108, the distributions are given in four different tables, whereas ECE uses a common grid, along with a graphical and numerical representation of the location of the test points. ECE values are expressed as percentages of the minimum H-V value. It was proposed that Standard No. 108's values be expressed in this fashion also. NHTSA decided that the least confusing way of adopting the test grid would be to substitute the pertinent portions of the text of the four SAE standards in question for the provisions currently incorporated by reference.

Comments were received from 18 motor vehicle manufacturers, motor vehicle associations, lighting equipment manufacturers, and interested related organizations such as the Insurance Institute for Highway Safety and the Department of California Highway Patrol.

All commenters discussing the proposed reduction in minimum rear yellow turn-signal candela supported it. Several, however, recommended adopting SAE values for lamps containing two and three compartments. (The agency had proposed 160 cd and 180 cd respectively, whereas the corresponding SAE values are 150 and 175.) NHTSA agrees with these recommendations. The differences between NHTSA and SAE values arose from calculations in rounding off extrapolations from the single compartment value. If it is desired to maintain the ratio of 1.6:1, for example, the exact value for two compartment lamps is 152. NHTSA chose to propose 160 cd, whereas the SAE adopted 150 cd. The SAE value is a mathematically correct way of rounding off the value, and is closer to the desired ratio. Accordingly, proposed Figure 1b is adopted with the revised values. The Notice erroneously proposed a maximum of 900 candela for both two- and three-compartmented yellow rear turn-signal lamps; the proper figure for the three compartment lamp that should have been proposed was 1050 cd, and Figure 1b as adopted corrects the error.

In commenting on the proposed adoption of the license-plate-lamp revision of SAE J587, it was pointed out that the version of August 1981 was never widely disseminated and never appeared in an SAE Handbook, whereas a version dated October 1981 has been. Only a minor editorial change distinguished the two versions. Therefore, Standard No. 108 is being amended to adopt the later version. In amending Tables I and III to specify J587 October 1981, the agency has taken the opportunity to correct erroneous footnotes and delete outdated ones. NHTSA wishes to clarify that, in accordance with paragraph S5.1 of Standard No. 108, the SAE J575 tests cross-referenced in SAE J587 are those of SAE J575e.

Similarly, a typographical error in proposed Figure 1b is corrected where the first two test points given in the proposal were "20U, 20D." The Figure adopted (Figure 1a) gives the correct ones: "10U, 10D," as well as adopting specific percentages of minima for turn-signal, stop, parking, and tail lamps.

Comments were varied on the proposed reduction in mounting height. Four commenters, California Highway patrol, Insurance Institute for Highway Safety, K-D Lamp Co., and the Auto Club of Southeast Ohio disagreed with the proposal. The principal ground of objection was the opinion that the reduction would have an adverse effect on seeing ability. Nine commenters, including the major motor vehicle manufacturers, agreed with the proposal in principle, but there was a split of opinion as to the preferred method of measurement. Three supported NHTSA's proposed dual method of measurement of 22 inches from lamp center to the roadway surface but not less than 19.7 inches to the lower edge of the illuminating surface (equivalent to the European metric method of expression). The remaining six commenters thought that the dual method was unnecessarily redundant, three supporting the 22-inch measurement, and the other three, the European method.

The agency has given considerable attention to the mounting-height comments, and reviewed all of the data relevant to this issue, particularly comments to the docket. Ford, GM and MVMA each reported upon their analytic studies of the effect of mounting height on seeing distance. Ford stated that its CHESS model, which evaluates headlamp performance, showed that "there is no significant change in the overall performance of a headlamp when its height is changed from 24 inches to 22 inches. Though there is a very small decrement in seeing distance as represented by a minuscule drop in the percentage of delineation detected . . . this is compensated in the overall performance by a similarly small decrement in the percent of drivers discomforted" due to less glare with a lower mounted headlamp.

GM's comments included a short analysis of the effect of a 2-inch reduction in headlamp mounting height. GM's analysis considered the theoretical change in seeing distance by calculating where the light would strike the road with a mounting height of 24 inches (229.5 feet) and a height of 22 inches (210.4 feet). According to GM's calculation, the 2-inch reduction in mounting height would theoretically cause the "seeing light" at the photometric test point of 0.5° down, 1.5° right, to strike the pavement 19.1 feet closer to the car.

However, according to GM, since the illumination of the light on the target is proportional to the inverse square of the distance between the light source and the target, the light striking the pavement at the point closer to the car would be brighter. Since the driver's ability to detect the target is dependent on the quantity of light falling on it, there is an intermediate distance where the light coming from the lamp at the 22-inch mounting height will have the same brightness as the lamp mounted at 24 inches does at 229.2 feet. GM calculations showed this to be at 224.5 feet down the road and, therefore, GM contends that a better estimate of the change in seeing distance would be a decrease of only 4.7 feet (229.2 feet - 224.5 feet).

MVMA conducted a series of computations utilizing the UMTRI computer program. MVMA found seeing distance reductions between 2.19 and 4.86 percent (approximately 4 to 10 feet) when using current headlamp designs. MVMA concluded that "the small variation of a few percent in threshold seeing distance attendant to a reduction in the headlamp mounting height will not alter driver safety." No other commenters provided new experimental data or analyses.

The agency has determined that the reduction in seeing distance that is attributable to a reduction of minimum mounting height to 22 inches would not have a significant effect upon safety. Other factors occurring on the road could have the same or greater effect on headlamp performance. These could include loading a vehicle with passengers, fuel, or cargo unevenly so as to lower the rear of the car, thus raising the angle of headlamp aim. At distances of 210-230 feet, the effect of changing the headlamps aim could be far greater than the effect of lowering headlamp height by 2 inches. Further, as Ford illustrated with the CHESS model, a possible beneficial effect upon safety would be the concomitant reduction in glare that a lower mounting height presents. Therefore, NHTSA has decided to adopt the proposal for a reduction in minimum mounting height.

The remaining issue, therefore, is the method by which the mounting height should be measured. After due consideration of the comments, NHTSA has decided that measuring the mounting height from the road surface to the center of the lens is the most reasonable approach. In comments to the NPRM docket on headlamp mounting height, Ford urged adoption of the 2-inch reduction in mounting height, but opposed adding a limit to the height of the bottom edge of a headlamp. Ford states that "there is no safety need to justify such a limitation on the height of the bottom edge of a headlamp when the center is specified; it is unnecessarily design restrictive; and, practically, the pendulum impact test of Part 581 of Title 49 of the Code of Federal Regulations, the Bumper Standard effectively limits the height of the bottom edge of a headlamp." The Bumper Standard specifies a pendulum impact test along a vehicle's front surface at any height from 16 to 20 inches above the ground, with no damage permitted to any lamp or reflective device except license-plate lamps. However, the impact-test pendulum has a relatively flat, 4.5-inch-high by 16-inch-wide surface, and headlamps could conceivably be recessed within a vehicle's bumper area and protected from pendulum impact. Several current vehicles have parking and turn signal-lamps recessed with the bumper, which illustrates this point. Therefore, NHTSA does not believe that the Bumper Standard effectively establishes a lower limit for headlamp mounting height.

The Department of California Highway Patrol (CHP) also commented on headlamp mounting height. CHP showed by example the inequity of the ECE method of measuring minimum headlamp height. CHP states that a potentially high-performance headlamp with a 7-inch vertical dimension would be required to have its center at 23.2 inches according to ECE regulations. On the other hand, it would permit the center of a less powerful 3.25-inch-high GM-proposed sealed beam unit to be only 21.3 inches above the ground, or 1.9 inches lower. CHP further stated that the proposed regulation would allow the smaller headlamps that had the lesser photometric performance to be mounted lower, providing a potentially greater reduction in seeing distance in comparison to the larger headlamps. Since the NPRM would not allow the center of a headlamp to be mounted lower than 22 inches, a less powerful 3.25-inch-high lamp could only be mounted at 22 inches rather than the 21.3 inches calculated by the CHP. However, as the CHP noted, the more powerful and taller headlamp would be required to have its center at 23.2 inches. Therefore, the taller headlamp would have to be mounted at a higher height and would be unfairly penalized if the ECE method were adopted in conjunction with a center-of-lens-to-roadway mounting height of 22 inches. Accordingly, this notice adopts a new minimum headlamp mounting height of 22 inches measured from the center of the lens to the road surface.

Comments to the docket on the proposed test grid amendments centered on three issues: the reduction of the number of test points from 27 to 19, the reduction of the number of zonal groups from 7 to 5, and the method of expressing the intensity of light at each test point as a percentage of the minimum H-V value.

Those commenters addressing the issue of the reduction of test points supported the agency's proposal, and the amendment is adopted. Consequently, the agency will test photometrics of stop, tail, turn-signal, and parking lamps on the basis of the 19 test points. While there was general agreement that the number of zones be reduced from seven to five, there was a difference of opinion as to the merits of the zones proposed by NHTSA, and those under consideration by the SAE in its proposed J586. Lighting equipment manufacturers generally favored the NHTSA scheme, while motor vehicle manufacturers preferred the SAE design. According to the motor vehicle manufacturers, the SAE zones consist of grouped test points with similar intensities. For example, the SAE's Zone 1 for stop lamps contains four test points with intensities of 16, 10, 10, and 16 candela, whereas NHTSA's Zone 2 for stop lamps contained three test points of 8, 8, and 28 candela. Ford Motor Co. stated that a more even pattern of light output will result from grouping points of similar intensities, and that on a grouping of test points with dissimilar intensities, a small variation in intensity of test points with higher nominal value of intensities can substantially alter the zonal sum. NHTSA has concurred with this recommendation and, to insure a more even pattern of light output, is adopting the SAE zone proposals.

However, the majority of comments were addressed to the third issue, the proposal to establish test point intensity values based on a percentage of the H-V test point value. Of the 13 comments received, only 1 one in full agreement. Two disagreed with the proposal. The remaining comments varied. Commenters basically agreed with the concept of a percentage approach but recommended that the test point values not be lower than current SAE values. It was pointed out that the NHTSA proposal adopting European rules would, in fact, lead to candela values for many of the test points that are lower than current minima required by Standard No. 108. One commenter recommended that the agency delay final rulemaking until the SAE approach on intensity values is reviewed.

The agency has carefully reviewed these comments. In reexamining the ECE and proposed NHTSA test grids, 15 common test points were found. In comparing values, NHTSA found that those for parking lamps would remain the same, but that lower values than are required at present would exist at all 15 test points for stop, tail, and turn signal lamps.

Although adoption of the proposal would come closest to achieving harmonization by using both the European test grid and the percentage values at the H-V point, the agency has concluded that this approach would not be in the interest of motor vehicle safety. Instead, it has adopted percentage values that are equivalent to those presently existing in Standard No. 108 for the four lamps in question. This will achieve a measure of harmonization, while insuring that the present level of lighting safety in the United States is not affected, and represents, the agency believes, a reasonable compromise.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. However, a final regulatory evaluation has been prepared and has been placed in the docket. The rule would impose no additional requirements but would permit manufacturers greater flexibility in design of motor vehicles and lighting equipment. The agency cannot predict the extent to which the manufacturers would utilize that flexibility.

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. The amendment should have no effect on the human environment since the weight and quantity of materials used in the manufacture of head lamps is not changed. No impact on safety is anticipated.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule would not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared.

Manufacturers of motor vehicles and lighting equipment, those affected by the proposal, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Finally, small organizations and governmental jurisdictions would not be significantly affected since the price of new vehicles and lighting equipment will be minimally impacted.

In consideration of the foregoing 49 CFR 571.108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as set forth below.

1. Paragraph S4.1.1.11 is removed, and a new paragraph S4.1.1.11 is added to read:

S4.1.1.11 A parking lamp, taillamp, stop lamp, or turn-signal lamp shall meet the minimum percentage specified in Figure 1a of the corresponding minimum allowable value specified in Figure 1b. The maximum candlepower output of each stop, turn signal, tail and parking lamp shall not exceed that prescribed in Figure 1b. The values specified in Figure 1a and Figure 1b are substituted for those specified in Table I of the following SAE Standards: J222 *Parking Lamps,* J585e; *Taillamps* (at H or above), J586c *Stop lamps* and J588e; *Turn Signal Lamps.*

2. Paragraph S4.1.1.12 is removed, and a new paragraph S4.1.1.12 is added to read:

S4.1.1.12 A parking lamp, taillamp, stop lamp or turn signal lamp is not required to meet the minimum photometric value at each test point specified in this standard if the sum of the percentage of the minimum candlepower measured at the test points is not less than that specified for each group listed in Figure 1c.

3. The references to "Figure 1" in paragraphs S4.3.1.1 and S4.3.1.7 are changed to "Figure 1c".

4. Figure 1 is removed and new Figures 1a, 1b, and 1c are added as follows:

Because of the importance of implementing the policy of the Trade Agreements Act, it is hereby found for good cause shown than an effective date earlier than 180 days after issuance is in the public interest, and the amendments are effective 30 days after publication in the *Federal Register.*

Issued on November 15, 1984.

Diane K. Steed
Administrator

49 F.R. 46386
November 26, 1984

Test points (deg)		Turn signal	Stop	Parking	Tail
10U, 10D	5L, 5R	20	20	20	20
	20L, 20R	12.5	12.5	10	15
5U, 5D	10L, 10R	37.5	37.5	20	40
	V	87.5	87.5	70	90
	10L, 10R	50	50	35	40
H	5L, 5R	100	100	90	100
	V	100	100	100	100

Figure 1a.—Required percentages of minimum candlepower of Figure 1b.

Lamp	Lighted Sections		
	1	2	3
Stop	80/300	95/360	110/420
Tail	2/18	3.5/20	5.0/25
Parking	4.0		
Red turn signal	80/300	95/360	110/420
Yellow turn signal rear	130/750	150/900	175/1050
Yellow turn signal front	200/	240/	275/
Yellow turn signal front [1]	500/	600/	685/

Figure 1b.—Minimum and maximum allowable candlepower values.

[1] Values shall apply when the optical axis (filament center) of the front-turn signal is at a spacing less than 4 inches (10 centimeters) from the lighted edge of the headlamp unit providing the lower beam, or from the lighted edge of any additional lamp installed as original equipment or used in lieu of the lower beam.

Group and test points	Turn signal	Stop	Parking	Tail
1 10U-5L, 5U-20L, 5D-20L, 10D-5L	65	65	60	70
2 5U-10L, H-10L, 5D-10L	125	125	75	120
3 H-5L, 5U-V, H-V, 5D-V, H-5R	475	475	420	480
4 5U-10R, H-10R, 5D-10R	125	125	75	120
5 10U-5R, 5U-20R, 5D-20R, 10D-5R	65	65	60	70

Figure 1c.—Sum of the percentages of grouped minimum candlepower.

5. Tables I and III, and the entry "Headlamps" in Tables II and IV are revised as follows:

TABLE I.—REQUIRED MOTOR VEHICLE LIGHTING EQUIPMENT

Multipurpose Passenger Vehicles, Trucks, Trailers, and Buses, of 80 or More Inches Overall Width

Item	Multipurpose passenger vehicles, trucks, and buses	Trailers	Applicable SAE standard or recommended practice
Headlamps	2 white, 7-inch, Type 2 headlamp units; or 2 white, 5¾-inch, Type 1 headlamp units and 2 white 5¾-inch, Type 2 headlamp units; or 2 white Type 2A headlamp units and 2 white Type 1A headlamp units.	None	J580a, June 1966; J579a, August 1965; J571d June 1976; and J566, January 1960.
	2 white headlamps: Type 2B1 or Type 2D1; or 4 white headlamps: 2 each Type 1C1 and Type 2C1, or Type 1A1 and Type 2A1.		J580b, February 1974; J579c, December 1974; J571d, June 1976; J1132, January 1976.
Taillamps [2]	2 red	2 red	J585e, September 1977.
Stoplamps [2]	2 red	2 red	J586c, August 1970
License-plate lamp[1]	1 white	1 white	J587, October 1981.
Reflex reflectors	4 red; 2 amber	4 red; 2 amber	J594f, January 1977.
Side-marker lamps	4 red; 2 amber	2 red; 2 amber	J592e, July 1972.
Backup lamp[1]	1 white	None	J593c, February 1968.
Turn-signal lamp[2]	2 red or amber; 2 amber	2 red or amber	J588e, September 1970.
Turn-signal operating unit[3]	1	None	J589, April 1964.
Turn-signal flasher	1	None	J590b, October 1965.
Vehicular-hazard warning-signal operating unit	1	None	J910, January 1966.
Vehicular-hazard warning-signal flasher	1	None	J945, February 1966.
Identification lamps	3 amber; 3 red	3 red	J592e, July 1972.
Clearance lamps	2 amber; 2 red	2 amber; 2 red	J592e, July 1972.
Intermediate side marker lamps[4]	2 amber	2 amber	J592e, July 1972.
Intermediate side reflex reflectors[4]	2 amber	2 amber	J594f, January 1977.

[1] See S4.1.1.10. [2] See S4.1.1.11-12. [3] See S4.5.6. [4] See S4.1.1.3.

TABLE II.—LOCATION OF REQUIRED EQUIPMENT—MULIIPURPOSE PASSENGER VEHICLES, TRUCKS, TRAILERS, AND BUSES, OF 80 INCHES OR MORE OVERALL WIDTH

Item Col. 1	Multipurpose passenger vehicles, trucks, and buses Col. 2	Trailers Col. 3	Height above road surface measured from center of item on vehicle at curb weight Col. 4
Headlamps	On the front, each type at the same height, 1 on each side of the vertical centerline; as far apart as practicable.	Not required	Not less than 22 in (55.9 cm) nor more than 54 inches (137.2 cm).

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TABLE III.—REQUIRED MOTOR VEHICLE LIGHTING EQUIPMENT

All Passenger Cars and Motorcycles, and Multipurpose Passenger Vehicles, Trucks, and Buses, of Less Than 80 Inches Overall Width

Item	Passenger cars, multipurpose passenger vehicles, trucks, and buses	Trailers	Motorcycles	Applicable SAE standard or recommended practice
Headlamps	2 white, 7-inch, Type 2 headlamp units, or 2 white, 5¾-inch, Type 1 headlamp units or 2 white, 5¾-inch, Type 2A headlamp units and 2 white Type 1A headlamp units.			J580a, June 1956; J579a, August 1965; J571d, June 1976; and J566, January 1960.
	2 white headlamps: Type 2B1 or Type 2D1; or 4 white headlamps: 2 each Type 1C1 and Type 2C1, or Type 1A1 and Type 2A1.			J580b, February 1974; J579c, December 1974; J571d, June 1976; J1132, January 1976.
			1 white	J584, April 1964; and J566, January 1960.
Taillamps[2]	2 red	2 red	1 red	J585e, September 1977.
Stoplamps[2]	2 red	2 red	1 red	J586c, August 1970.
High-mounted stoplamp	1 red, for passenger cars only	Not required	Not required	J186a, September 1977.
License-plate lamp[1]	1 white	1 white	1 white	J587, October 1981.
Parking lamps[2]	2 amber or white	None	None	J222, December 1970.
Reflex reflectors	4 red; 4 amber	4 red; 2 amber	3 red; 2 amber	J594f, January 1977.
Intermediate side reflex reflectors[5]	2 amber	2 amber	None	J594f, January 1977.
Intermediate side marker lamps[5]	2 amber	2 amber	None	J592e, July 1972.
Side marker lamps	2 red; 2 amber	2 red; 2 amber	None	J592e, July 1972.
Backup lamp	1 white	None	None	J593c, February 1968.
Turn-signal lamps[3]	2 red or amber; 2 amber	2 red or amber	2 amber; 2 red or amber	J588e, September 1970.
Turn-signal operating unit[3,4]	1	None	1	J589, April 1964.
Turn-signal flasher	1	None	1	J590b, October 1965.
Vehicular-hazard warning-signal operating unit	1	None	None	J910, January 1966.
Vehicular-hazard warning-signal flasher	1	None	None	J945, February 1966.

[1] See S4.1.1.10. [2] See S4.1.1.11–12. [3] See S4.5.6. [4] See S4.1.1.5. [5] See S4.1.1.3.

TABLE IV.—LOCATION OF REQUIRED EQUIPMENT ALL PASSENGER CARS AND MOTORCYCLES,AND MULTIPURPOSE PASSENGER VEHICLES, TRUCKS, TRAILERS, AND BUSES OF LESS THAN 80 INCHES OVERALL WIDTH

Item	Passenger cars, multipurpose passenger vehicles, trucks, trailers, and buses	Motorcycles	Height above road surface measured from center of item on vehicle at curb weight
Col. 1	Col. 2	Col. 3	Col. 4
Headlamps	On the front, each type at the same height, 1 on each side of the vertical centerline; as far apart as practicable.	On the front, on the vertical centerline, except that if two are used they shall be symetrically disposed about the vertical centerline.	Not less than 22 in. (55.9 cm) nor more than 54 inches (137.2 cm).

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PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment

[Docket No. 84-04; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 108 to allow motor vehicles to be equipped with a new four-lamp rectangular sealed beam headlamp system smaller than that currently allowed. A notice of proposed rulemaking ("NPRM") on This subject was published on April 30, 1984 (49 FR 18321).

The system, to be known as Type F, consists of two lamps which produce lower beam light and two lamps which produce upper beam light. The system will not utilize the supplementary upper beam from the lower beam headlamp as is the practice in current four-lamp systems.

Type F headlamps, though mechanically aimable, do not incorporate traditional lens-mounted aiming pads, and a special aimer adapter has been designed for the system. Because the aiming and seating planes are identical, the minimum amount of rquired horizontal aim is reduced from plus or minus 4 degrees to plus or minus 2 1/2 degrees.

The weight and volume of Type F headlamps are about half those of headlamps used in current four-lamp rectangular headlamp systems and the new system therefore offers the prospect of improved fuel economy through lighter vehicle weight and more aerodynamic front end design.

This notice completes initial rulemaking action implementing the agency's grant of petitions for rulemaking by General Motors Corporation, which developed the system, and American Motors Corporation. A second notice of proposed rulemaking on issues of simultaneous use of Type F headlamps, co-aiming and optional availability of an auxiliary filament will be published shortly.

EFFECTIVE DATE: July 1, 1985.

SUPPLEMENTARY INFORMATION: On April 30, 1984, NHTSA published a notice of proposed rulemaking implementing grants of petitions for rulemaking submitted by General Motors Corporation (GM) and American Motors Corporation (AMC) to amend Standard No. 108 to permit the use of new, smaller, rectangular sealed beam headlamps in a four-lamp system. GM, which developed the system, believes that it offers improvements in lower and upper beam photometric output, and improved aiming characteristics. Because of reduction in weight and volume, the system offers the potential for improved aerodynamics and enhancement of fuel economy. Comments were received from eight manufacturers of vehicles or lighting equipment, the Motor Vehicle Manufacturers Association (MVMA) and the California Highway Patrol (CHP).

Characteristics of the GM System

The new four-lamp rectangular sealed-beam system features headlamps with upper and lower beam performance which is different than that currently required. The supplementary upper beam traditionally found in four lamp systems is not necessary for the system to meet photometric requirements for the upper beam. NHTSA chose to designate the lamp as Type F with a prefix indicating its function, "UF" for the upper beam Type F, and "LF" for the lower beam Type F. Each Type F headlamp is of a size, 92 mm x 150 mm, such that its overall volume and weight are approximately half those of headlamps used in the current 4 1/2″ × 6″ four-lamp rectangular system (Types 1A1 and 2A1). Thus, there is an inherent potential for more aerodynamic front ends featuring the new lighting system which, together with the lower weight of the system and its mounting hardware, offer the opportunity for improved fuel economy.

Upper Beam Performance

Auxiliary Filament

One feature of the original system that was requested by GM was an auxiliary filament in the lower beam lamp that would provide some light during upper beam operation.

The primary photometric contribution of this 35-watt, auxiliary filament would be to provide "incidental" light (5000 cd max, 1500 cd min) at the brightest light intensity test point (H-V). However, the upper beam lamp alone could meet the requirement at this test point as well as all other test points.

GM said that there were four other possible reasons for an auxiliary upper beam filament to be located in the lower beam lamp:

1. To serve as a heating element to prevent ice from forming on the lower beam lamp during upper beam use.
2. To mark the outside, leading edges of the vehicle during upper beam use.
3. To be use as a daytime front running lamp.
4. To prevent the owner from perceiving that there is less available light during upper beam use.

GM did not believe that the auxiliary filament was necessary for upper beam enhancement, heating purposes, or edge delineation, but it could be offered as a driver option to allow consumers to have a choice between more light or better fuel economy during upper beam use or, alternatively, to be used as a daytime running light. GM's wish to offer the auxiliary filament as a driver option was not accepted by NHTSA in the NPRM because no requirements were recommended, and NHTSA did not desire to propose additional requirements for switching and "tell-tales" that advise the driver about what headlamp elements would be in operation. Without proper advisories and switching safeguards, driver confusion and misuse could result.

Since the upper beam lamps alone could meet current upper beam photometric requirements NHTSA proposed use of upper beam lamps alone as one option during upper beam operation. NHTSA also proposed the option of using the lower beam lamp along with the upper beam lamp during upper beam selection. Since the 35-watt, auxiliary filament in the lower beam lamp provided only incidental light with low light-energy efficiency, the agency rejected use of this filament during ordinary upper or lower beam operation. However, the auxiliary filament could conceivably serve as a daytime running light, a concept under consideration in Canada, and the NPRM proposed that an auxiliary filament could be incorporated and used for that purpose.

In an initial response to the NPRM, GM stated that there were several good reasons for eliminating the auxiliary filament in the lower beam lamp. First, the NPRM proposed that this filament would be permitted to be used only as a daytime running lamp, and GM had found alternative methods of producing such a light at lower operating wattages. Eliminating the auxiliary filament would eliminate filament shadow and improve lamp reliability and durability. Therefore, on May 11, 1984, GM directed a letter to NHTSA and 41 other headlamp manufacturers, users, and researchers noting that GM intended to recommend eliminating the auxiliary filament and inviting comment on that recommendation.

On May 30, 1984, GM recommended deletion of the auxiliary filament instead of allowing it as an option as the NPRM had proposed. GM pointed out that this would eliminate the need to develop and provide two versions of the lower beam headlamp—one with and one without the auxiliary filament. GM noted that the proposed upper beam headlamp could be used as a daytime running light by electronically reducing the power consumption to 16 watts per upper beam lamp, which would provide a better lamp for that purpose since it would provide more efficient light with appropriate beam pattern, rather than "extraneous" or "incidental" auxiliary beam light. Other claimed advantages for eliminating the auxiliary beam were savings due to fewer connections and leakage paths in the lower beam lamp, a smaller-diameter bulb tube that might allow longer lamp life, lower piece cost, and less capital investment.

Seven other commenters recommended deletion of the auxiliary filament (Lucas Industries, VW, GE, Ford, AMC, CHP, and MVMA with the exception of Chrysler), citing advantages similar to those stated by GM and noting no disadvantages. The CHP stated they were not "overwhelmed by the ethereal reasons for lighting all four lamps" that were given by car manufacturers at the time these lamps were introduced, and therefore had no objection to deleting the auxiliary filament. Chrysler requested an opportunity to incorporate an auxiliary filament in the headlamp system so that such a filament could be used as a potential daytime running light in Canada. Chrysler's analysis indicated that incorporating the auxiliary filament might be significantly more cost efficient than adding supplemental lamps.

Sylvania believed that from a safety standpoint, it may be unwise not to emit light from the lower beam headlamp during upper beam selection because this lamp is installed at the outside edges of vehicles and serves as an indicator of car position for on-coming drivers. Because of these factors, Sylvania believed that elimination or the optional use of this capability to illuminate the lower beam lamp be given careful thought.

NHTSA considered all the above comments, and has decided not to incorporate the proposed auxiliary filament in the lower beam lamp since its removal offers overall better headlamp performance, and viable alternatives appear to exist for daytime running lights. Sylvania's recommendation to use the proposed auxiliary filament for edge delineation was considered along with other comments regarding the optional use of either the upper beam lamp alone or both the upper beam lamp and main lower beam filament during upper beam selection. NHTSA believes that there are no other safety reasons for mandating the use of the outer lamp as discussed below:

- As designed by GM the new system does not need the illumination assistance of the "extra" filaments, requiring only the single upper beam filaments to perform as well as many other lamps currently available.
- When four headlamp systems were first introduced, front parking lamps were not required to be illuminated when the headlamps were on. At that time, it probably seemed reasonable that the illuminated outboard lower beam headlamps marked the edge of the vehicle. Parking lamps are now required to be on and help perform this edge marking function.
- Additionally, when the upper beams are on, it is unlikely that side markers lamps and possibly the parking lamps would be seen, because of positional and contrast problems. Thus the relationship of the vehicle width and the inboard headlamp location would still be unknown to the oncoming driver. But it is also unlikely that upper beams would be on when oncoming drivers are close enough to need to know where the front corner of the opposing vehicle is.
- Another reason suggested in the comments for illumination of the lower beam lamp is to provide heat to prevent ice from forming on the lower beam lens while using the upper beam. While this may have been the argument for lighting the low beam when four-lamp systems were initially developed in the 1950's, the agency knows of no data which support the need to provide, by regulation, a solution to a problem of ice forming on a lens that is temporarily not in use.
- Thus, while there may be historical precedence for having the outer lower beam headlamp illuminated during upper beam use, there appears to be no valid safety-oriented basis to require it.

For the reasons discussed above, NHTSA has determined that an auxiliary filament is not needed in the Type LF lamp and therefore that feature of the April 30, 1984, NPRM has not been adopted. However, in light of the interest shown by at least one manufacturer (Chrysler) in incorporating such a filament on an optional basis, the agency will seek, in a notice to be issued shortly, additional comments as to whether to permit the inclusion of an auxiliary filament.

Simultaneous Use

More efficient and potentially effective light for upper beam enhancement seemed available from the main lower beam filament in the lower beam lamp. Instead of providing light to the right and above the road as the auxiliary beam would, the lower beam would provide significant additional light on the road, and add significant spread light to further illuminate the roadway shoulders. Using this filament during upper beam selection would also eliminate any potential concern about ice formation, edge delineation, or less available light. Preliminary GM test data were examined to evaluate potential upper beam photometric compliance problems in using this approach. NHTSA concluded that the probability of exceeding the two current maximum values, 75,000 cd. and 7,500 cds. respectively, for the brightest light intensity test point (H-V) and the foreground light test point (4D-V) was very low. Both the lower beam and the upper beam are limited in total output at or near the point of highest intensity (H-V), production practices tend to limit the number of very high output lamps, and the likelihood of four very high output lamps being placed on the same vehicle was considered to be vey low. Therefore, NHTSA proposed that manufacturers have a second option of using both the main lower beam filament and the upper beam lamp during upper beam operation and requested comment on the feasibility of this approach.

Data submitted by GM on pre-production lamps have shown, contrary to NHTSA's belief, that some photometric maxima values may be exceeded during the simultaneous use of the upper and lower beams. The CHP also expressed its concern ove the potential for this. Therefore, NHTSA has decided to reconsider this proposal in a separate notice of proposed rulemaking.

Photometric Performance

In the April 30, 1984, Notice of Proposed Rulemaking, it was proposed that the upper beam light of the Type F system would be produced by only one of the two lamps on each side of the vehicle. This is in contrast to all existing four-lamp systems, which use both lamps to produce the upper beam. It was also proposed that the manufacturer have the option of wiring a vehicle in such a way that the lower beam lamps would operate during upper beam operation. These two features of the Type F system led to a proposed set of photometric criteria for the UF lamp that are different than the upper beam criteria for other four-lamp systems. The CHP noted that this change would provide a "worthwhile" increase in required lamp output, since it was above the lowest-performing, current production designs. Based on the response to the proposed upper beam photometric values, and since they provide a level of safety equivalent to that already provided by Standard 108, NHTSA is amending Standard No. 108 to incorporate these values.

Lower Beam Performance

At present, the lower beam lamp in a four-lamp system provides some of the upper beam light—it has a second filament to do this. Also, the lens prescription of the current lower beam lamp is designed for this dual function. In the system requested by GM, the lower beam lamp produces only lower beam light and thus its lens prescription can be optimized for the low beam function. GM claimed that the benefit of using this design approach would be that the lower beam lamp could be designed for optimum performance and increased seeing light.

Except for 1 of 13 test point values, GM's final recommended lower beam photometrics were within the currently required test point value ranges. The one exception was an increase to a maximum value at a test point (½D-1½L to L) that was located near the glare zone. GM wanted to increase this value from 2,500 cd to 3,000 cd to reduce the sensitivity of the lamp to horizontal misaim and to permit more uniform left lane lighting. In conjunction with this increase, GM recommended increases in the minimum values at the seeing light test point and at spread light points.

The California Highway Patrol (CHP) believed the proposed changes would be the first concrete step taken to improve the Federal lower beam requirement, citing the increase in minimum test point values by 20% to 33% in four areas of the lower beam with no further increase in maximum glare values above the horizontal. Ford recommended that the Type F system should be approved but disagreed with all new proposed photometric values and with NHTSA's tentative position that the proposed values represented an improvement in lighting. Ford pointed out that its CHESS computer headlamp evaluation model was gaining wide respect as an appropriate and objective tool for testing lighting performance, and commented that the proposed lower beam lamp "did not show any significant improvement in overall headlamp performance" when it was evaluated by the CHESS model.

Sylvania stated that the proposal offered improvements in photometrics, noting "it is desirable to improve the performance of headlamp systems whenever they are considered. It should be the policy of NHTSA and the lighting industry to insure that any item or device that is considered, both now and in the future, be equivalent or better than existing lighting systems." Sylvania believed the increased spread light requirements of the proposed lamp system were justified and it urged adoption of these requirements.

General Electric (GE) endorsed the improved photometrics but also desired an increase in the 10U-90U glare value from 125 cd maximum to 175 cd maximum. The purpose for this glare increase would be to allow for random spots of higher intensity light that can occur from stray reflections of light inherent in halogen bulbs. NHTSA believes this increase is not the best solution because lamp designers would then be designing for a higher level of 175 cd, and increase the potential for unsafe veiling glare that would result during inclement weather.

AMC fully supported the photometric changes sought by GM and proposed in the NPRM. GM noted that it designed the proposed system for its customers, but felt that no justification had been shown that this level of performance should be required of all new headlamp systems.

The one suggested increase in a maximum test point value (½D-1½L to L) was initially of some concern to NHTSA because that test point location is close to the glare zone. Increases in this test point value could result in higher glare intensity levels if the headlamps were aimed too high, but it would also permit more uniform lighting ahead of the vehicle. A recent NHTSA study[1] recognized this potential problem, but the study also found that drivers can accept higher glare levels without discomfort. A 100% increase in this test point value was thought to be reasonable based on the study data, while GM recommended only a 20% increase.

The CHP and Ford also expressed some concern about increasing this test point value. The CHP noted that the 20% increase should allow better seeing ability, but it does not alleviate the complaints of compact-car drivers about the excessive brightness of high-mounted headlamps on taller four-wheel-drive pickups. Ford noted that photometric values are more sensitive to the vertical aim of the headlamp and an increase in the general intensity of a beam in these areas makes the lamp more susceptible to causing glare. The MVMA stated that there was no reason to expect this headlamp system to exhibit any new performance characteristic that would cause a level of glare significantly different from the glare produced by currently permitted headlamps. However, the MVMA believed that more research was needed to address the subject of discomfort glare from headlamps. GE supported this value, and no other commenters directly addressed this subject.

After considering these comments, NHTSA has concluded that the 20% increase in this test point value is well within the 100% increase thought to be reasonable by the most current research on the subject, and that adopting this value should not pose any safety problem.

In its petition, GM had also added a new test point value (1D-V) that it claimed was necessary to prevent the lower beam from being aimed too far to the right. GE, the only commenter on this subject, believed this new test point was design-restrictive and redundant, noting that the test point ½D-1½R controls excessive aim to the right. NHTSA believes that beam patterns which meet this specification at 1D-V have the potential for placing more light down the road, as the petitioner claimed. However, NHTSA accepts the GE position that the specification for this point may be redunant with the specification at ½D-1½L to R. Therefore, this specification is not adopted as part of Figure 15.

In summary, on the basis of the proposal and the comments, NHTSA continues to believe that the level of safety inherent in the proposed photometric test points is equivalent to the level provided by existing lamp systems and that the proposed photometrics are appropriate for lamp systems of this design. Additionally, NHTSA will apply these photometrics to future lamp systems of similar design, where one optical system is dedicated to lower beam use and another optical system is dedicated to upper beam use. Such systems would include those with either four lamps or four light sources.

The proposed photometric values seemed to represent an improvement in lower beam photometrics because more light would be provided in roadway locations where pedestrians and other objects must be seen and avoided. Therefore the NPRM asked whether these photometrics should be required for all headlamp systems. All commenters who addressed this question felt that it was inappropriate at that time to apply these photometric criteria to all existing systems. In the absence of significant, quantitative evidence on the safety effects of these values, the agency is not adopting their use on all headlamp systems.

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[1] "Improved Low Beam Photometrics," Olson and Sivak, University of Michigan Transportation Research Institute; Interim Report No. UM-HSRI-81-4, February, 1981; Final Report No. UMTRI-83-9, March, 1983.

Additionally, NHTSA agrees with the suggestion from Ford and MVMA that some type of objective evaluation tool is needed for identifying safety improvements in roadway illumination performance. A program for development of such a tool will be initiated in the near future. This program will build on the extensive research base that already exists as well as the computer techniques that have been developed by Ford, MVMA and others.

Luminance

According to GM, the proposed lamp has a lens light-emitting area of 9,271 square mm, and the current small rectangular headlamp has a lens light-emitting area of 14,014. Therefore, the proposed lamp is about 1/3 smaller in lens light-emitting area than the current small rectangular headlamp. Since both of these lamps have similar glare point intensity limits, the proposed lamp would have a higher luminance value. (Luminance is the ratio of light intensity to the light-emitting area.) Generally, there is a potential for an increase in glare when a lamp of given intensity is reduced in lens area and, therefore, is increased in luminance. To date, there is no known recognized method to objectively compare the influence of headlamp luminance values to the potential for discomforting glare. GM stated that its subjective tests did not indicate a glare problem, and NHTSA tentatively accepted this finding. However, comment on this issue was requested in the NPRM.

Four commenters did not directly address this issue (Lucas, VW, GE, and AMC); Chrysler stated that it did not have sufficient experience with the proposed system to make any recommendations; five commenters (GM, Ford, Sylvania, MVMA, and the CHP) believed there would be no safety problem. GM noted that test results to date indicate "substantially less" light-intensity levels in the glare zone for the proposed headlamps as compared to current large rectangular headlamps (142 mm × 200 mm). As a result, GM believed these lower light-intensity levels "should more than make up for any brightness differences which may be attributed to size differences." GM also noted that for a comparable amount of seeing light, the proposed system will have a substantially lower intensity of glare light than any other headlamp size. Subjectively, GM believes that increased seeing light is the more important factor, and does not find the brightness to be objectionable.

Ford noted that the brightness distribution over the lens area of headlamps generally is not uniform—the size, shape and brightness gradients all are contributing factors. Ford surmised that although the proposed lamp is smaller, it will not exhibit any difference in glare from other headlamps of slightly greater size. Sylvania believed the design geometry of the lamp, along with the photometric requirements, would prevent the luminance factor from being a problem. The CHP and MVMA did not expect any discomfort glare effects. Since there was no objection from commenters and no additional information is available, NHTSA has concluded that luminance will likely not be a problem with the Type F headlamp system.

Improved Aiming Features

Current sealed-beam headlamps are positioned or seated in their mountings through the use of lugs located on the back of the reflector, which form a seating plane, but they are aimed through the use of aiming pads located on the lens face, which form an aiming plane. GM claimed that the proposed new headlamp would have more accurate aiming features than current sealed-beam headlamps because it would be designed to have the seating plane and the aiming plane coincide. Pads on the front of the lens-to-reflector flange would be used as a common plane to seat the lamp in its mounting and to aim the lamp.

A NHTSA evaluation of the dimensional tolerances that are allowed for current headlamp units indicated that the skew error in angular alignment between the seating and aiming planes can be as large as ± 2.9°. Since the seating plane and aiming plane would be constructed to coincide in the proposed GM lamp system, this skew error would be eliminated. As a result, if a properly aimed headlamp is replaced, the replacement headlamp should remain properly aimed. Since replacement of headlamps without re-aiming has become a frequent practice, this new design should result in greater numbers of properly aimed replacement headlamps. The agency believes that proper aim reduces glare to oncoming drivers and improves seeing distance for both drivers. Eliminating the skew error would also reduce the amount of mechanical aim adjustment that must be provided to aim the lamp. Therefore, NHTSA proposed to reduce the minimum amount of required horizontal aim adjustment from ± 4° to ± 2½°.

And, since this approach has the potential to improve aim retention and reduce mechanical aim adjustment requirements on future headlamps, NHTSA asked whether common seating/aiming planes should be required on future headlamps.

Four commenters did not directly address this proposed common seating/aiming plane requirement (Lucas, Ford, GE, and AMC). Chrysler stated that it did not have any experience with the proposed headlamp system and could not make any recommendations, but it believed that the inclusion of design-oriented requirements inhibits design freedom and innovation. Five commenters (GM, Sylvania, VW, MVMA, and the CHP) generally agreed that the design seemed achievable and had merit. While GM and MVMA agreed that the requirements seemed appropriate for the Type F lamp system, they did not support such a requirement for other headlamp systems, noting this requirement would not necessarily be practical for replaceable bulb headlamps and could stifle future innovation.

The CHP argued this aspect should be clearly stated in the standard as a direct requirement rather than its intent being inferred by the proposed figures. NHTSA believes that the proposed rule is quite specific about requiring the lamps to be designed to meet the requirements of the new proposed figures and, therefore, does not believe further statements are necessary. Since all comments favored applying this requirement to only the proposed lamp system, and not to all future headlamp systems, NHTSA has adopted this aspect of the proposal for only the Type F system and will not consider it for all future headlamp systems.

Regarding the proposed reduction in horizontal aim adjustment, three commenters did not directly address this issue (Lucas, GE, and AMC), while six commenters (GM, Sylvania, Chrysler, VW, Ford, and the MVMA) supported the reduction and the CHP opposed it. Sylvania believed that the current horizontal and vertical aim adjustments of ± 4° were more than was necessary for any headlamp system. Chrysler submitted that current horizontal aim adjustment requirements were excessive and could be reduced for all headlamp systems. The CHP agreed that the common aiming/seating plane would eliminate the described skew error, but it also found that during its random inspection of vehicles, a number of headlamps were misaimed "considerably beyond" the 1.9° range of aim measuring equipment. Therefore, reducing the minimum adjustment range to ± 2.5° did not seem to leave much room for all the possible sources of misaim due to lamp and mounting hardware tolerances.

The report "Analysis of Sources of Error in Headlamp Aim"[2] indicates that when aiming/seating plane skew errors are eliminated, the range needed to compensate for other sources of error is about ± 0.115° when mechanically aiming and about ± 0.988° when optically aiming. An adjustment range of ± 2.5° appears adequate to compensate for errors. The standard is therefore amended to reduce horizontal aim adjustment for headlamps with a common aiming/seating plane.

GM had petitioned for, and NHTSA subsequently proposed, a method to simultaneously aim both the lower and upper beam lamps. Both lamps would be mounted in a common housing and would have a common aim adjustment. Comments from the CHP and GE noted that applying requirements to the entire headlamp assembly was not normal industry practice. The CHP also pointed out that on the requirements for aim tolerances, it is necessary to specify what portion of the ± 1/4° reaim would be applied to the lamps and what portion would be applied to the mounting assembly. CHP's suggestion about the further need for specifying such tolerances may have merit, but such changes cannot be accomplished unless the public is allowed to comment. Therefore, this proposal for simultaneous aim will be reconsidered and addressed in the separate notice of proposed rulemaking.

Headlamp Aimer Adapter

The current standard requires that all headlamps must be mechanically aimable. In order to meet these requirements, GM proposed an adapter for current mechanical aiming equipment that seemed to offer an acceptable means of mechanical aim. To provide sufficient lead time for inspection stations and repair facilities to obtain the adapters, NHTSA proposed that these adapters be provided with each vehicle that is manufactured with the proposed headlamps up to July 1, 1986.

No comments were received about the type of adapter proposed, and only GM and AMC commented on the requirement to equip vehicles with these adapters. Both GM and AMC project that use of the proposed lamps will be "very substantial," with GM tentatively planning to market over a half-million vehicles with the proposed headlamp system prior to July 1, 1986. GM estimated it would be issuing almost 10 times the number of adapters that are needed in the field if it must meet the proposed requirement. Therefore, as an alternative to meeting this requirement, GM proposed to assure that an ample supply of adapters would be available for sale in more than adequate time to meet any field needs. GM noted that its good faith has already been demonstrated, since it has already purchased the adapter tooling and it will not realize any profit. AMC believes that there will be sufficient motivation to supply these adapters, and with the normal industry pre-model process and practice of keeping up with new technology, there should be no problem in incorporating the use of these adapters. Therefore, both GM and AMC recommended against adoption of this aspect of the proposal. NHTSA has concurred in those comments.

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[2] "Analysis of Sources of Error in Headlamp Aim," Olson and Mortimer, University of Michigan Transportation Research Institute, March 1974.

Three principal aspects of the April proposal have been determined to merit further consideration. The first of these was the optional use of the lower beam during the use of the upper beam. The second was the co-aimability of the upper and lower beam Type F lamps. The last is the optional use of the auxiliary filament. The agency has decided to re-propose these features of a Type F system in a separate notice. That notice will provide an analysis of the comments on these issues from the April 1984 NPRM as well as the reasons behind the new proposal. It is anticipated that the proposed changes to the rule being adopted today will have an effective date of July 1, 1985.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. However, a regulatory evaluation has been prepared and placed in the public docket. Since use of Type F headlamps is optional, the rule will impose no additional requirements but will permit manufacturers greater flexibility in the use of headlighting systems.

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. The rule may have a small positive effect on the human environment, since the weight and quantity of materials used in the manufacture of headlamps will be reduced.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule would not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles and headlamps, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Finally, small organizations and governmental jurisdictions will not be significantly affected, since the price of new vehicles, headlamps, and aimer adjusters will be minimally impacted.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, is amended as follows:

1. Paragraph S4.1.1.34 is revised by adding the following at the end of the chart:

System	Headlamp Type	Number of Headlamps
	* * * * *	
6	Type UF .... and Type LF	1 1

2. New sections S4.1.1.43, S4.1.1.44, and S4.1.1.45 are added to read:

* * * * *

S4.1.1.43 Instead of being equipped with a headlighting system specified in Table I or Table III, a passenger car, multipurpose passenger vehicle, truck or bus manufactured on or after July 1, 1985, may be equipped with a headlighting system of two Type UF and two Type LF headlamps designed to conform to:

(a) The dimensions specified in Figures 11, 12, 13, and 14.

(b) The photometric requirements of Figure 15.

(c) The requirements of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles*, December 1978, with the following exceptions:

(1) The definitions in sections 2.4 through 2.11 do not apply.

(2) In Section 2.12, the definition of "Mechanically Aimable Sealed Beam Unit" is: "A unit having three pads, defining a mechanical aiming plane, used to adjust and inspect the aim of the unit when installed on the vehicle."

(3) In Section 2.13, the definition of "Aiming Plane" is: "A plane defined by the three aiming pads."

(4) Section 3.4 does not apply.

(5) Tables 1 and 2, and Figures 1 and 2 do not apply.

(6) In Section 3.5.1 and 3.5.3, references to "Tables 1 and 2" and Figure 3 are replaced by "Figure 15."

(7) Section 3.6 does not apply.

(d) When tested in accordance with Section 3.5.2 of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles*, December 1978, the mounted assembly (either Type UF or Type LF headlamps, respective mounting ring, aiming ring, and aim adjustment mechanism) shall be designed to conform to meet the requirements of Figure 15 for upper or lower beams respectively without reaim when any conforming Type UF or LF headlamp is tested and replaced by another conforming headlamp of similar type.

(e) The requirements of SAE Standard J580, August 1979 *Sealed Beam Headlamp Assembly*, with the following exceptions:

(1) Section 2.2 Mounting Ring reads: "the adjustable ring upon which the sealed beam unit is mounted and which forces the sealed beam unit to seat against the aiming ring when assembled into a sealed beam headlamp assembly."

(2) The definition "2.3 Aiming Ring" reads: "The clamping ring that retains the sealed beam unit against the mounting ring, and that provides an interface between the unit's aiming/seating pads and the headlamp aimer adapter (locating plate)."

(3) In Section 3, the correct version of SAE J575 is "SAE 575f (April 1975).

(4) Section 4 does not apply.

(5) Section 5.1 reads: "Headlamps shall be designed so that they may be inspected and aimed by mechanical aimers as specified in SAE J602 October 1980, without the removal of any ornamental trim rings or other parts."

(6) Section 6.1.1 reads: "When the headlamp assembly is tested in the laboratory, a minimum aiming adjustment of ± 2.5 deg. shall be provided in the horizontal plane and ± 4 deg. in the vertical plane."

(7) Section 6.1.2 reads; "...through an angle of ± 2.5 deg. and ± 4 deg., respectively."

(8) Section 6.3 is retitiled "Retaining Ring/Aiming Ring Tests."

(9) In Section 6.3.2 add the flange thickness "92 × 150 mm..........0.340 in. 8.6 mm)"

(10) Figures 2, 3, and 4 do not apply, and the reference to them in Section 6.5 is replaced by "Figure 16, Deflectometer, of Federal Motor Vehicle Safety Standard No. 108."

S4.1.1.44 The lens of each headlamp designed to conform to paragraph S4.1.1.43 shall be marked with:

(a) The designation "F" if it provides an upper beam, or "LF" if it provides a lower beam; and

(b) The symbol "DOT" (either horizontally or vertically) which shall constitute a certification that the headlamp conforms to all applicable Federal motor vehicle safety standards.

S4.1.1.45 Each headlamp designed to conform to paragraph S4.1.1.43 shall also be designed to conform to the following specifications:

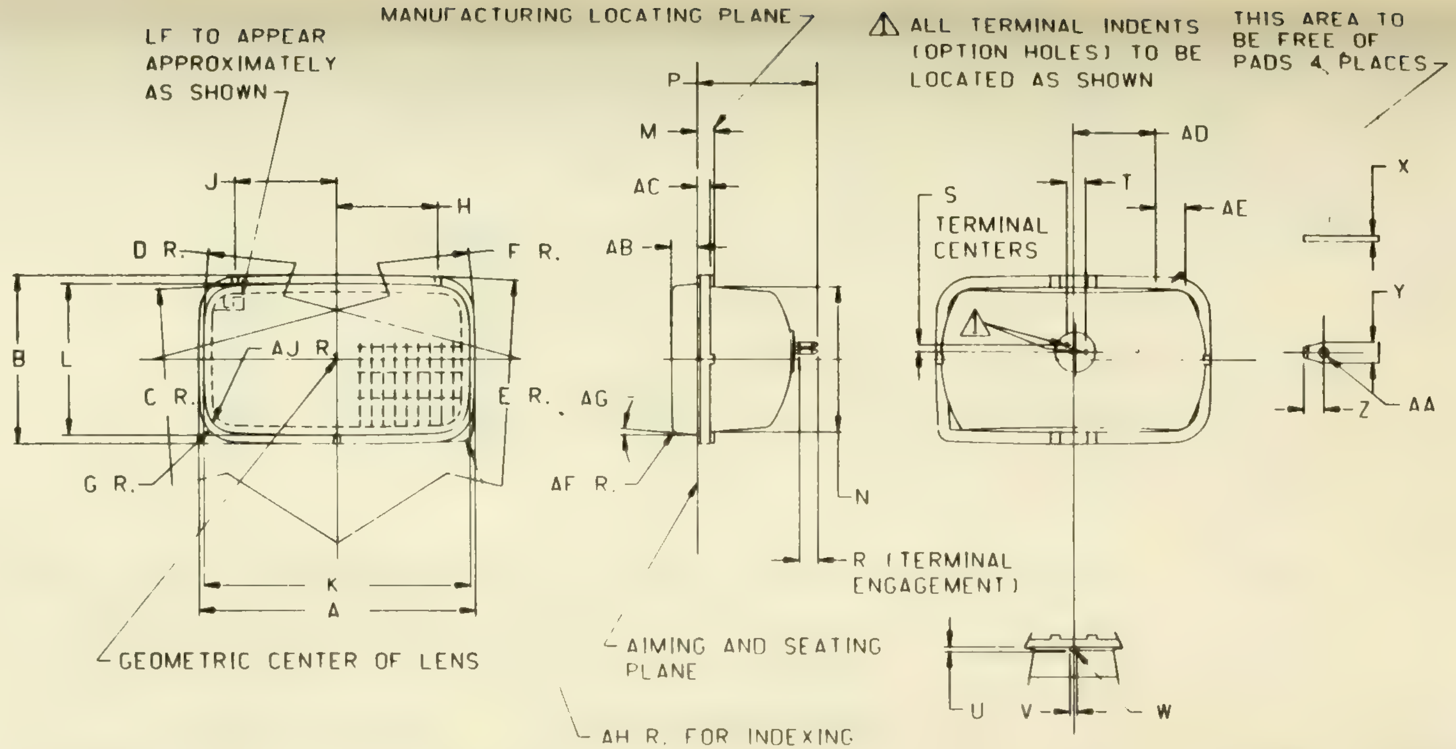
	Type LF	Type UF
Watts @ 12.8 V (design voltage	60 max	70 max.
Average Life @ 14.0 V (rated voltage)	320 hr.	150 hr.

3. New Figures 11, 12, 13, 14, 15, and 16 are added as follows:

Issued on December 20, 1984.

Diane K. Steed
Administrator

49 FR 50176
December 27, 1984



LETTER	INCH	MM
A	5.93 + .050 − .040	150.50 + 1.20 − 1.00
B	3.64 + .050 − .040	92.50 + 1.20 − 1.00
C	63.0 ± 3.94	1600.0 ± 100.0
D	23.6 ± 1.97	600.0 ± 50.0
E	63.0 ± 3.94	1600.0 ± 100.0
F	23.8 ± 1.97	600.0 ± 50.0
G	.781 ± .010	20.00 ± 0.30
H	2.16 ± .010	55.0 ± 0.30
J	2.16 ± .010	55.0 ± 0.30
K	5.689 + .008 − .040	144.50 + 0.20 − 1.00
L	3.252 + .008 − .040	82.60 + 0.20 − 1.00
M	.46 MAX.	11.7 MAX.
N	3.19 MAX.	81.0 MAX.
P	2.81 MAX.	73.0 MAX.

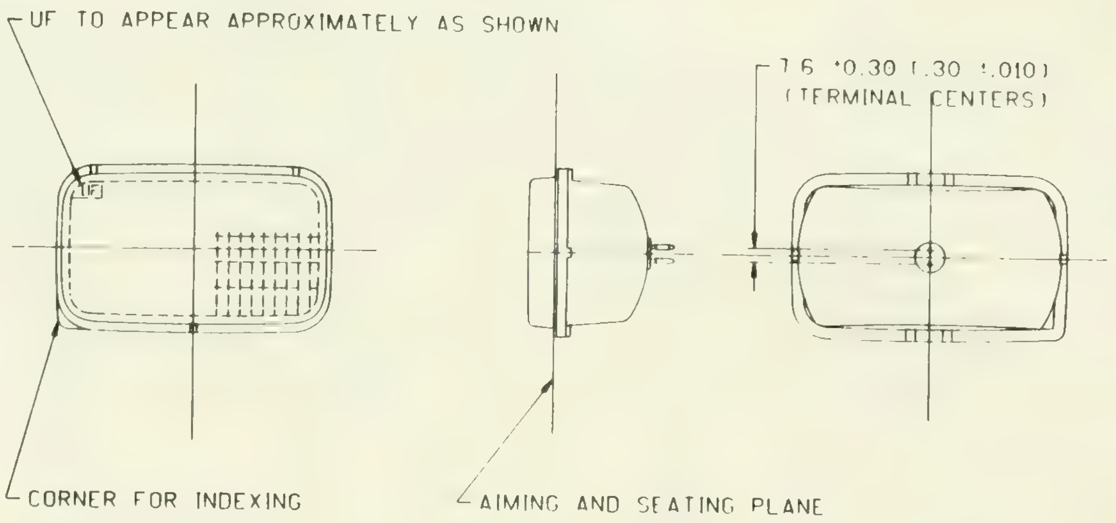
LETTER	INCH	MM
R	.41 MIN.	10.5 MIN.
S	.15 ± .010	3.8 ± 0.30
T	.41 ± .010	10.43 ± 0.30
U	.024 MIN.	0.60 MIN.
V	.315 MAX.	8.0 MAX.
W	RADIUS	RADIUS
X	.032 ± .002	0.82 ± 0.04
Y	.110 ± .004	2.80 ± 0.10
Z	.104 ± .010	2.65 ± 0.30
AA	.051 ± .010 DIA.	1.30 ± 0.30 DIA.
AB	.54 ± .020	14.3 ± 0.50
AC	.295 MAX.	7.50 MAX.
AD	1.77	45.0
AE	.63	16.0
AF	.13 ± .02	3.2 ± 0.5
AG	5° ± 1°	5° ± 1°
AH	.24 ± .02	6.0 ± 0.5
AJ	.63 MIN.	16.0 MIN.

FIG. 11 -

TYPE LF

RECTANGULAR
SEALED BEAM
HEADLAMP UNIT

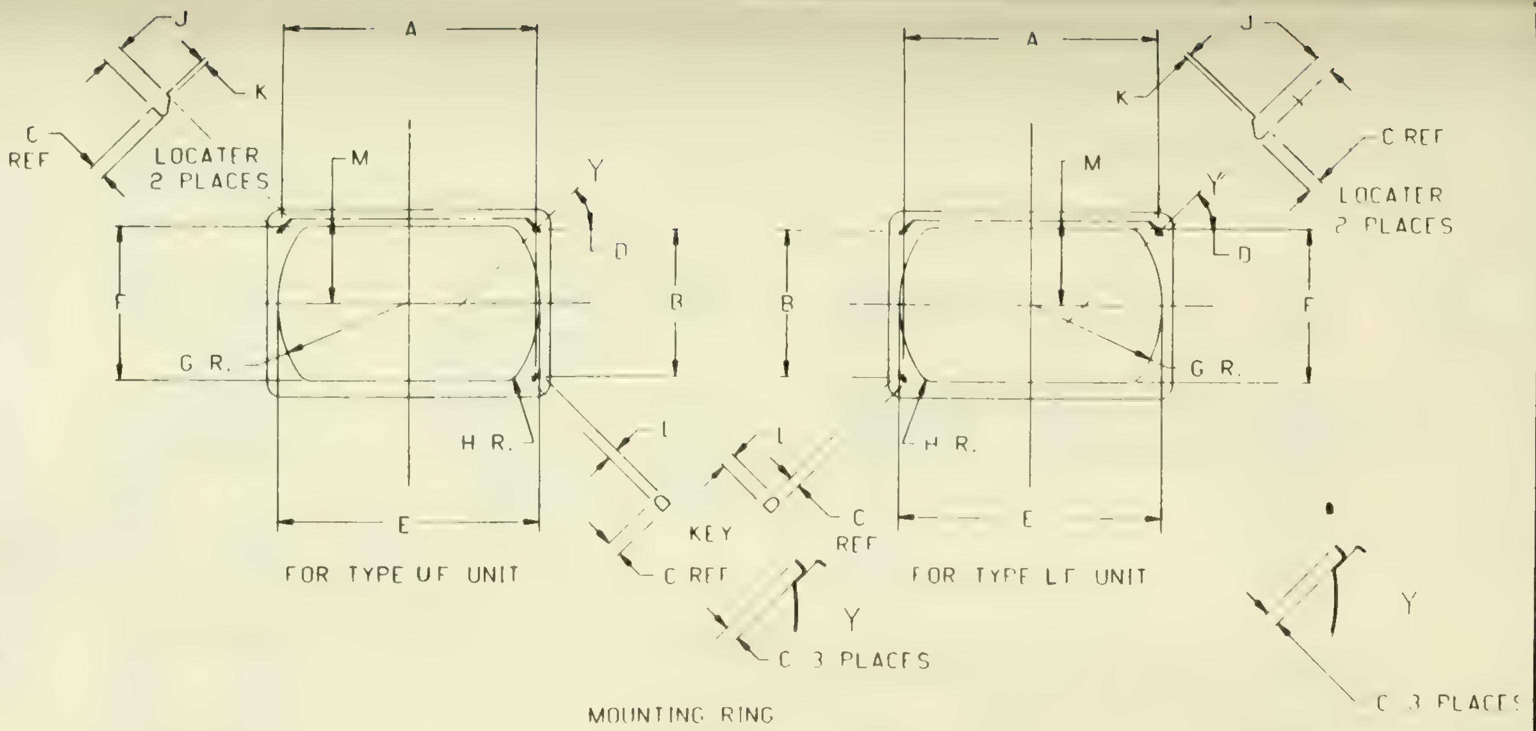
GL-178A OAF



NOTE: SAME AS TYPE LF EXCEPT AS SHOWN
(.XX) INCH DIM.

FIG. 12 - TYPE UF

RECTANGULAR SEALED BEAM HEADLAMP UNIT

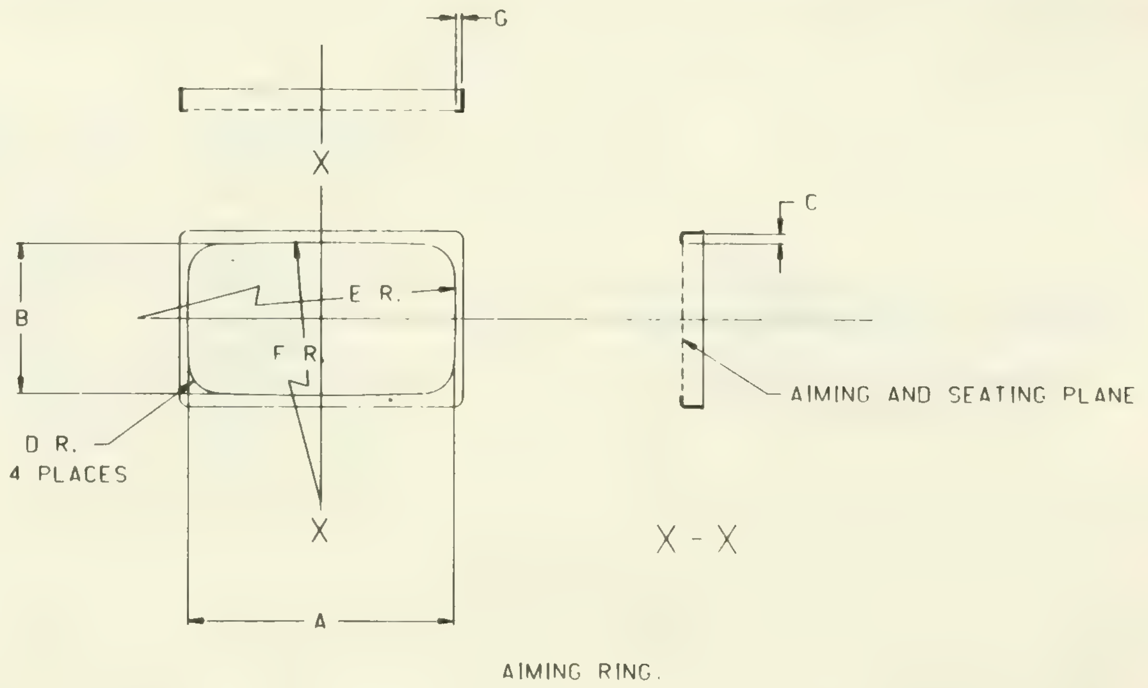


LETTER	INCH	MM
A	$5.433^{+.012}_{-.000}$	$138.00^{+0.30}_{-0.00}$
B	$3.150^{+.012}_{-.000}$	$80.00^{+0.30}_{-0.00}$
C	.315 ± .02	8.0 ± 0.5
D	45° 3 PLACES	45° 3 PLACES
E	5.63 ± .010	143.0 ± 0.30
F	3.307 ± .010	84.00 ± 0.30
G	2.79 ± .12	71.0 ± 3.0
H	.32 ± .04	8.0 ± 1.0
J	.39 ± .04	10.0 ± 1.0
K	.17 ± .07	4.3 ± 1.7
L	.24 ± .04	6.0 ± 1.0
M	1.823 ± .013	46.30 ± 0.30

FIG. 13 - FRONT VIEW OF KEYS OR LOCATORS FOR TYPE LF AND UF

RECTANGULAR SEALED BEAM HEADLAMP UNIT MOUNTING RINGS

GL-176A [illegible]



LETTER	INCH	MM
A	5.721 ± .006	145.30 ± 0.30
B	3.284 ± .006	83.40 ± 0.30
C	.213 MIN.	5.40 MIN.
D	.670 MAX.	17.00 MAX.
E	23.7 ± 2.0	602.2 ± 50.0
F	63.0 ± 3.93	1600.0 ± 100.0
G	.134 MIN.	3.40 MIN.

FIG. 14 - AIMING/SEATING RING FOR TYPE LF AND UF RECTANGULAR SEALED BEAM HEADLAMP UNITS

FIG. 15

PHOTOMETRIC TEST POINT VALUES

UPPER BEAM

Test Points deg[b]	cd. max.	cd. min.
2U-V	--	1,500
1U-3R and 3L	--	5,000
H-V	70,000	40,000
H-3R and 3L	--	15,000
H-6R and 6L	--	5,000
H-9R and 9L	--	3,000
H-12R and 12L	--	1,500
1-1/2D-V	--	5,000
1-1/2D-9R and 9L	--	2,000
2-1/2D-V	--	2,500
2-1/2D-12R and 12L	--	1,000
4D-V	5,000	--

LOWER BEAM

Test Points deg[b]	cd. max.	cd. min.
10U-90U[a]	125	--
1U-1-1/2L to L	700	--
1/2U-1-1/2L to L	1,000	--
1/2D-1-1/2L to L	3,000	--
1-1/2U-1R to R	1,400	--
1/2U-1R to 3R	2,700	--
1/2D-1-1/2R	20,000	10,000
1D-6L	--	1,000
1-1/2D-2R	--	15,000
1-1/2D-9L and 9R	--	1,000
2D-15L and 15R	--	850
4D-4R	12,500	--

[a] From the normally exposed surface of the lens face.

[b] A tolerance of ±1/4 deg in location may be allowed for at any test point.

HEADLAMP TEST FIXTURE

92 x 150 MM

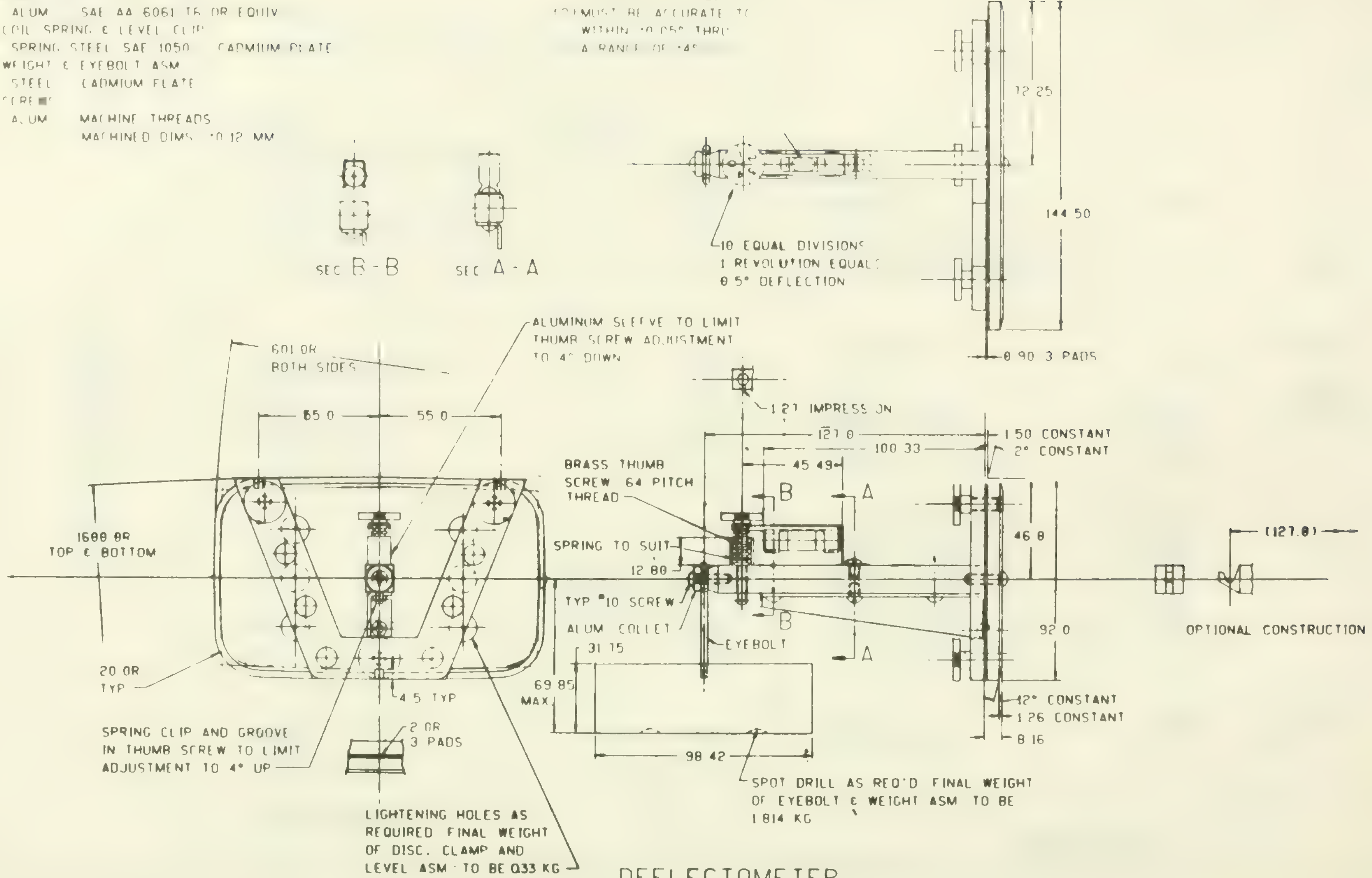
DIMENSIONS ARE IN MM

MACHINE MATERIALS

- DISC, ARM, BRACE & CLAMP
  ALUM SAE AA 6061 T6 OR EQUIV
- COIL SPRING & LEVEL CLIP
  SPRING STEEL SAE 1050 CADMIUM PLATE
- WEIGHT & EYEBOLT ASM
  STEEL CADMIUM PLATE
- SCREWS
  ALUM MACHINE THREADS
  MACHINED DIMS ±0.12 MM

(1) 5.0 OR BUBBLE MOVEMENT MUST INDICATE 0.25° SENSITIVITY OR BETTER

(2) MUST BE ACCURATE TO WITHIN ±0.05° THRU A RANGE OF ±4°



DEFLECTOMETER

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment; Correction

[Docket No. 83-12; Notice 3]

ACTION: Final rule; correction.

SUMMARY: This notice corrects an error in the amendment published on November 26, 1984 (49 FR 46386) relating to lamps, reflective devices and associated equipment. The error appears in the amendment to Tables II and IV. It is therefore necessary to correct the error. The maximum mounting height for headlamps was omitted.

SUPPLEMENTARY INFORMATION: In the final rule on harmonization amendments published on November 26, 1984 (49 FR 46386), in amending Tables II and IV to reflect the revised minimum mounting height for headlamps, the maximum height was inadvertently omitted and must now be reinstated. That height is 54 inches.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

§571.08 [Amended]

On page 46391, in Tables II and IV of 49 CFR 571.108, Column 4 of each is amended as follows:

Height above road surface measured from center of item on vehicle at curb weight
Column 4
Not less than 22 inches (55.9 cm) nor more than 54 inches (137.2 cm)

Issued on January 17, 1985.

Barry Felrice
Associate Administrator
for Rulemaking

50 FR 3911
January 29, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment

[Docket No. 81-11; Notice 13]

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 108 to allow motor vehicles to be equipped with replaceable bulb headlamp systems consisting of either four lamps with single standardized replaceable light sources, or two lamps each with two such light sources. Currently Standard No. 108 permits replaceable bulb systems only if they are comprised of two lamps with single standardized light sources. The amendment relieves the current replaceable bulb headlamp design restriction that allows only two-lamp single-light source systems.

Notice of the proposed amendment was published on December 7, 1984, and an opportunity afforded for comment (49 FR 47880). The proposal implemented the agency's grant of a petition for rulemaking by General Motors Corporation. It also responded to a petition by Volkswagen of America previously denied.

EFFECTIVE DATE: May 22, 1985.

SUPPLEMENTARY INFORMATION:

Background

On June 2, 1983, NHTSA amended Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, to allow the use of a replaceable bulb headlamp system (48 FR 24690). This system is comprised of two headlamps, each with a standardized replaceable light source containing both an upper and lower beam filament.

Among the petitions for reconsideration of the rule was one from Volkswagen of America, asking that a four-lamp system be allowed, each with its own light source, which would be the standard dual-filament light source which the agency had adopted. NHTSA denied this petition (48 FR 44815), commenting that rulemaking which would allow dual-filament light sources in a four-lamp configuration, or two dual-filament light sources in a single cavity, could not be entertained until certain issues could be considered further. As the notice stated, these issues involved whether only two lamps should be illuminated on upper beam (in four-lamp systems all four are presently required) and if so whether it is important that the front corners of the vehicle be otherwise indicated. Other issues concerned simultaneous actuation of light filaments in a headlamp system (this could produce excessive illumination) and uncertainties in the ability to insure correct simultaneous upper beam or lower beam aim if the bulb reflector systems were not separate upper and lower beam units. Subsequently, General Motors Corporation petitioned the agency for rulemaking to allow a two-lamp system with two standard dual-filament light sources in a single cavity. The agency granted that petition and published a notice of proposed rulemaking (NPRM) on December 7, 1984 (49 FR 47880). As there was a similarity between the system that VW wished the agency to consider, and the one for which a petition was granted, the two systems proposed by the NPRM were simply those incorporating quadruple light sources. The agency reviewed the issues on which the previous denial was based, and presented them for discussion and comment in the NPRM.

GM argued that the two-source system it has requested will allow it greater freedom in designing aerodynamic front ends than the present standard for replaceable bulb headlamps. Under the present standard, considering the possible out-of-focus relationship of the filament to the focal point of the reflector in a current replaceable bulb headlamp, the headlamp's vertical dimensions may be greater than desirable for aerodynamic purposes. By installing two light sources in the same headlamp, a smaller height is possible if the lower and upper beam filament are placed exactly on the focal point of their respective parabolas. Benefits attributable by GM to this intended system of headlamps of lesser height include possible improvements in photometric performance and improved fuel economy through aerodynamic efficiency by lowering the edge of the hood.

As the NPRM noted, another benefit could occur because only one filament would be in use in each dual-filament standardized replaceable light source in four-lamp systems and two-bulb systems. For example, should a lower beam filament burn out, the light source could be immediately interchanged with the adjacent upper beam light source, whose lower beam filament would not have been utilized. After the exchange, the burned-out lower filament would become irrelevant as the upper beam filament in that bulb would now be available for use.

Both existing replaceable bulb photometrics and photometrics similar to those proposed for Type F sealed beam headlamps were proposed. Comments were solicited on each photometric option.

GM would aim both bulbs in a single housing by a single adjustment, such as is currently used in the two-lamp round and larger rectangular systems. The GM system can utilize the same aimer adapters that are available for single replaceable bulb headlamps.

Four-headlamp systems such as VW contemplates offer distinctive design possibilities which are similar but not identical to those offered by systems with two bulbs per lamp. NHTSA proposed that four-lamp replaceable bulb headlamp systems consist of two lamps providing upper beam photometrics, and two lamps providing lower beam photometrics. The reflectors of these lamps would be designed to optimize the lower beam filament at the focal point of the lower beam lamp reflector and optimize the lens prescriptions for dedicated lower beam use. The upper beam lamp would be optimized in a similar manner. This type of system has been adopted for the new smaller four-lamp Type F sealed beam system (49 FR 50176). The dedicated lens prescription of each lamp would be marked "U" for upper beam, or "L" for lower beam, as appropriate. In conjunction with the option proposing Type F lamp photometrics, simultaneous use of the upper and lower beam would have been permitted as a manufacturer's option, and new glare limits would be added to the photometric requirements to help minimize potential problems from excessive foreground light during simultaneous use.

Because of the shorter life of filaments producing the upper beam, the agency also proposed that the lower beam photometrics be met by lower beam filaments alone. For the same reason, it was proposed that simultaneous activation of both filaments in a single bulb be prohibited, since the bulb is not designed to be used in this manner, and bulb life would be shortened. As this proposed amendment affects the standardized replaceable bulb, it would be applicable to all lamp configurations using that bulb, including the two-lamp/one bulb per lamp system previously adopted.

The agency also proposed revisions in the wording describing the aiming pad prescription requirements, clarifying them and relieving design restrictions. In effect, the agency would allow headlamps which may utilize mechanical aimer adapters with three adjustable legs. Accordingly, it was proposed that Figures 9-1 and 9-2 be deleted and appropriate changes made in the text.

In addition to comments on the merits of the system proposed by the NPRM, the agency was also interested in comments relating to the relationship between headlamp replacement costs and safety. Although GM has told NHTSA that the replacement cost of the glass lens/plastic reflector assembly for its new lamps would be in the neighborhood of $35, the actual cost could be several times higher for low volume designs. If that cost were not subsidized by the manufacturer, it could well be over $100 per lamp. Current retail cost for a replacement light source at Ford dealers is $16.75. Therefore, since the same light source (bulb) would be used in the GM system, the total replacement cost for the GM system, including lens/reflector assembly, two light sources, and labor, was estimated at about $80. It is estimated that about one complete headlamp will need to be replaced over the lifetime of the vehicle due to accident or stone damage. Therefore, the agency solicited specific comments on the following issues: The relationship between cost and the probability of replacement of headlamp or bulb, the time lag that may exist between outage and replacement because of costs, and the extent to which cost considerations of nonmandated headlamps should enter into the agency's rulemaking considerations.

Ford Motor Company, whose petition was implemented by the amendment (48 FR 24690), had emphasized to the agency that one of the primary safety benefits of the new type of headlamp was that the light source could be replaced without removal of the headlamp, replacement of the lens-reflector portion of the headlamp, or the necessity to reaim. With respect to the vehicle on which the system has been first installed, the Mark VII, bulb replacement is a simple matter of opening the hood, finding the rear of the headlamp, disengaging the old bulb by a twist of it in its mounting, and replacing it in a similar manner. The agency had been informed by General Motors that it intends to use replaceable bulb headlamps on a number of its 1986 model car lines, but that on two of these lines, the light source cannot be replaced without removing the headlamp itself. Since this situation was not envisioned with replaceable bulb headlamps, the agency sought comments on this issue; that is, is there a relationship between vehicle safety and the ability to replace the bulb without tools. The agency desired a quantitative assessment, to the extent practicable.

NHTSA also sought comment on the possibility of problems with aligning optical aiming equipment with lamps which have more than one bulb.

In implementation of the considerations discussed above, NHTSA proposed that the definition in paragraph S3 of "replaceable bulb headlamp" be amended to include headlamps with two standardized replaceable light sources. It was noted that this light source is the only allowable light source for use in achieving the required upper or lower headlamp beam pattern. Under NHTSA interpretations, however, the standardized replaceable light source is not the only light source which may be included in a replaceable bulb headlamp unit. Other light sources, such as parking lamps, turn signal lamps, and fog lamps are not prohibited, as long as they do not interfere with the required headlighting function.

The agency also sought to clarify the language in the standard regarding several of the testing requirements. The agency intended that headlamps utilizing the standardized replaceable bulb shall be able to meet the applicable performance requirements of Standard 108 with any standardized replaceable bulb intended for use in that lamp. Thus, for example, lamps must be able to pass the tests referenced in paragraph S4.1.1.36(b) not only with the bulb used as original equipment in that lamp but also with bulbs from other manufacturers intended for use in that lamp. Since most replaceable bulbs will be sold in the aftermarket and not as original equipment (assuming the same distribution of sales as for sealed beams), this requirement is necessary to ensure the proper functioning of the headlamp so that it meets the need for motor vehicle safety. Specifications on the bulb itself, already promulgated by the agency, ensure that manufacturers have a reasonable design envelope within which to produce their lenses and reflectors. This clarification would result in an amendment to paragraph S4.1.1.36(b).

NHTSA proposed that a headlamp with two light sources or a lamp in the system of four replaceable light sources meet the upper and lower beam photometric requirements of Table I of SAE J579c or new photometric requirements in proposed Figures 17 and 18, stating that a final decision would be made between these two choices. The agency proposed also that the aim of the upper beam of dual light source headlamps cannot be adjusted separately from that of the lower beam light source. This proposal applies only to headlamp systems which are comprised of two headlamps and contain two bulbs in each headlamp. In these instances, there is only one set of aiming pads on each lamp, yet there are two bulb reflector sets in that lamp. If both upper and lower beam lamps are not aimed simultaneouosly—that is, with a single aiming adjustment—then consumers, or repair facilities would not be able to aim the lamp using the aiming pads but would be required to disassemble the lamp to adjust each reflector separately. This proposal, which was applicable only to the two-lamp, four-bulb system ensures that proper headlamp aiming, which the agency has traditionally considered necessary for motor vehicle safety, is achievable with current aiming equipment. It was further proposed that the lower beam be produced by a filament with an average life of 320 hours, the equivalent of the current lower beam light source filament. Paragraph S4.1.1.38(d) would be modified under the proposal to check for lens deflection in front of each bulb following the internal heat test.

In adopting replaceable bulb headlamp systems, the agency, in S4.1.1.39 required, for the period July 1, 1983, to July 1, 1984, that each vehicle be equipped with a spare bulb as part of its original equipment. The agency noted that it anticipated that replaceable bulbs should be readily available through normal distribution channels at the end of the one year period. The agency is satisfied that such bulbs are available and therefore proposed the deletion of S4.1.1.39, which has expired.

Similarly, the agency adopted paragraph S8 to require, until July 1, 1984, that each vehicle also be furnished with adapters for mechanical aiming devices. The agency was convinced that sufficient adapters are available and that there should be no problems in inspection and aiming of motor vehicles with replaceable bulb headlamps which are not provided with these adapters. Therefore, NHTSA also proposed, *pro forma,* deletion of paragraph S8, which is no longer in effect.

New paragraphs would be added to S4.5 to guarantee that only appropriate filaments will be energized. For systems which use four standardized replaceable light sources, it was proposed that Tables II and IV be be amended to state that the outermost light source (in a two-lamp system) or outermost lamp (in a four-lamp system) be used to produce the lower beam. This serves to mark the width of the vehicle during low beam use, as a cue to oncoming drivers.

Paragraph S6.7, relating to temperature and internal heat tests, would be modified for multiple bulb headlamps. Both upper and lower beam photometrics would have to be met after each test. During the hot cycle, the highest combination of filament wattages capable of being used would be energized simultaneously (e.g., fog lamps, parking lamps, turn signal lamps).

Paragraph S6.8, relating to the humidity test, would be amended to add temperature tolerances to the final phase of the test which have heretofore been inadvertently omitted. Currently the specification is 73 °F (23 °C). The agency proposed adding a tolerance of +7-0 °F (+4-0 °C). In addition, the agency proposed reducing the excessively large tolerances on the humidity tolerance from ±10% to +5%-0% and the temperature from ±9 °F to +9-0 °C (+4-0 °C). This is being done to increase test result repeatability and make the test requirement more definitive.

On Figure 4-1, one aiming pad was misidentified as a Class II pad: that would be corrected. In addition, this Figure would be amended to illustrate the proposed definition of aiming reference plane. The title of Figure 4-2 would be modified to reflect its use as an example. Figure 7 would be changed to permit a wider test box since some headlamps would not fit into one of 16 inches width; 24 inches is proposed.

Issues

Comments were received on the notice from six motor vehicle manufacturers, one vehicle manufacturers trade organization, one test laboratory and the Department of California Highway Patrol; seven comments were also received from manufacturers of lighting equipment.

The major issue presented by the proposal was whether the presently applicable photometrics of SAE J579c met by the two standardized replaceable light sources in current two-lamp systems should also apply if four such sources were permitted, or whether the photometrics recently adopted for the Type F four-lamp smaller sealed beam system would be preferred. Commenters almost unanimously opposed Type F photometrics for the proposed type of headlighting system. The reason for the opposition is that the standardized replaceable light source uses transverse filaments while the filament in Type F lamps is axial. NHTSA concurs with the concerns expressed by commenters, and is adopting the existing photometrics of SAE J579c for the two headlighting systems incorporating four standardized replaceable light sources.

A second issue of concern to commenters was the proposed prohibition against simultaneous use of upper and lower beams in a four-lamp system, if the J579c photometrics were allowed, as contrasted with the lack of such a prohibition for systems with Type F photometrics. The principal reason for the difference is that Type F photometrics contemplate such use, and compensate for it, while SAE J579c does not. Therefore, on four-headlamp systems, simultaneous use of both upper and lower beam, or use of all four lamps for either upper or lower beam, is prohibited. Commenters interpreted the prohibition as forbidding use of the "optical horn" or flash-to-pass feature found on many cars. NHTSA did not intend to prohibit this feature and the final rule specifies the exception allowing momentary signaling use. On two-lamp systems, simultaneous use of both light sources in a headlamp is permitted in either the upper or lower beam mode. However, the requirement for both lamps of a two-lamp system to produce light which satisfies either the upper beam specifications of J579c or the lower beam specifications of J579c effectively prohibits other beam patterns, such as a mixture of upper and lower beam photometrics, except for momentary signaling.

Commenters were also concerned with proposed S4.1.1.36(b) which would have required compliance of each replaceable bulb headlamp "with any standardized replaceable light source intended for use in such headlamp." NHTSA's intent was that each headlamp should be designed to conform with any randomly selected bulb meeting the specifications of Figure 3 and produced by any manufacturer. General Motors and others suggested that such headlamps be "designed to conform" with any bulb, rather than "conform", and the final rule adopts this suggestion.

The proposed environmental test requirements were the source of many comments. In order to insure a humidity environment of not less than 90%, the agency proposed a relative humidity of 90-0+5%. Commenters instead interpreted this as a tolerance and suggested plus or minus 2 or 3 percent as more appropriate. NHTSA wishes to clarify that it intends a test environment "of not less than 90%" relative humidity and has therefore adopted the words as quoted. Other comments received advised NHTSA that the Notice failed to specify that the flasher, if tested simultaneously with the headlamp, should be flashing at its normal rate, and that a continuous flashing for one hour (the test period) was inappropriate. In recognition of these comments, the procedure adopted specifies that the flasher shall operate at 90 flashes a minute with a 75±2% "on time" (the rate intended to produce maximum "on time"). NHTSA believes that the one-hour duration of flashing, for the turn signal, is appropriate due to the use of these lamps as hazard warning signals. This value is based upon Figure 1, SAE Recommended Practice J590b *Automotive Turn Signal Flashers,* October 1965, already incorporated by reference in Standard No. 108 as the standard for turn signals.

With respect to lens markings, comments were received that the agency should not restrict markings to the outside of the lens, but to allow them to be placed inside for facilitation, under some circumstances, of the marking of the adjustable mechanical aimer setting. NHTSA concurs with this request, and the final rule so permits. Comments were also submitted as to the size of the lens lettering, NHTSA having proposed a minimum size of .25 inch. This size could interfere with the lens prescription of smaller headlamps. Motor Vehicle Manufacturers Association suggested .157 inch (4mm), the minimum height specified for Vehicle Identification Numbers, and NHTSA has acceded to this request. A concurring amendment also deletes dimension G in Figure 4-4.

There were a number of comments as well which raised other technical issues. Ford Motor Co. recommended deleting the language in proposed S4.1.1.36(a)(2) regarding the secondary aiming plane, saying that it was unnecessary and created confusion. However, NHTSA has adopted the language as proposed, in order to cover such theoretically possible headlamps as those with split slope, or reverse slope lens. Ford also requested that the agency not adopt a requirement that the outermost lamp or bulb produce the lower beam, arguing that it would be applicable only to replaceable bulb headlamps. The agency disagrees; Standard No. 108 already in essence requires this for sealed beam headlamps by specifying that Type 2 headlamps, those providing the lower beam, be as far apart as practicable.

Stanley Electric Co. Ltd. of Japan requested that there be no aim adjustment allowable, by consumers, between the high and low beam reflectors on headlamps with two light sources. NHTSA agrees, and this was the intent of the addition of paragraph (e)(1) to S.4.1.1.36. Stanley also requested language be added to the standard to permit adjustments during the manufacturing process. Such adjustments are already permitted and the agency believes that additional regulatory language is unnecessary. Thus, the reflector and requirements of S.4.1.1.36(e)(1) are adopted as proposed.

Ford and Volkswagen objected to the wiring harness requirements proposed in paragraph S4.5.9. VW argued that strict adherence might be precluded by assembly considerations. Ford believed it unduly design restrictive. NHTSA has concluded that this paragraph should prevent situations such as a four-lamp system from being used when only two lamps were intended to be used, and that in the absence of such a requirement there might be excessive glare and candela beyond the maximum allowed by the standard. Therefore the paragraph is being adopted as proposed.

General Electric requested a clarification of paragraph S4.1.1.36(b)(2) on how the aiming reference plane should be located in a photometer when measuring an inseparable two-lamp/two-bulb per lamp system, specifically whether the upper beam is measured on or off the photometric axis, assuming that the lower beam is measured on axis. NHTSA expects the aiming pads to be located on the optical axis of the lower beam portion of the headlamp when only one light source is used for the lower beam.

With respect to paragraph S6.7.2, Hella commented that the internal heat test for two-bulb headlamps was unnecessarily severe and costly because the test is repeated on both upper and lower beams in the same headlamp. The agency does not agree, because the power level is different for each beam, as is the location of thermal input. Thus, a warp in the headlamp housing could develop from heat in either location.

ETL Testing Laboratories raised the question as to compliance of a turn signal in a replaceable headlamp assembly. For example, if moisture is evidenced after the humidity test, does the turn signal fail to conform, even though it is required as a turn signal to meet only the water spray test in SAE J575, June 1970. NHTSA wishes to clarify that in this example, it is the headlamp assembly that is being tested for compliance, not the turn signal which, nevertheless, must conform to SAE J575 and other turn signal tests.

ETL also commented that warpage after thermal testing might be more severe above the line of the headlamp's mechanical axis. Without judging the merits of that comment, NHTSA believes that there could be a problem if the mechanical axis is not in front of a bulb; this could occur if two bulbs are used in a headlamp and the axis is midway between the bulbs. The agency is therefore revising some of the language in Subsections (A) and (B) of paragraph S4.1.1.36(d)(6). The phrase "when measured perpendicular to the aiming plane at the point of intersection of the mechanical axis with the exterior surface of the lens" is revised by deleting the word "mechanical" and substituting "replaceable light source."

The agency also asked for comments on several general issues related to replaceable bulb headlighting for which no specific requirements were proposed. NHTSA asked if there were a relationship between vehicle safety and the ability to replace a bulb without tools. As noted, NHTSA was under the impression that replaceable bulb headlamps *per se* would be designed with easily replaceable light sources, which would encourage timely replacement in the event of burn-out. Those who commented agreed with NHTSA's intuitive conclusions that safety would be benefitted but provided no quantitative assessment. GM believed that such a feature was preferable and stated that it planned to eliminate the need for tools in future designs. Comments generally supported the need for ease of replacement, and NHTSA will defer any further action on this issue for the present time.

NHTSA also expressed concern about replacement costs; the relationship between cost and the probability of replacement of the lamp or light source, the time lag that may exist between outage and replacement because of costs, and the extent to which cost consideration of non-mandated headlamps should enter into the agency's rulemaking considerations. Comments were varied and inconclusive, and the following are illustrative: a vehicle equipped with headlamps with a glass lens may have a higher lifetime cost than one equipped with headlamps with a polycarbonate lens because of the greater susceptibility to stone damage of glass lenses; the cost of light sources will probably fall when additional manufacturers enter the market; the time lag for any repair may be longer on an older car than on a newer one; no quantifiable relationship exists. If there were a common view it was that NHTSA's primary concern should be the performance of the headlamp itself, and the assurance that new types of systems should perform, at a minimum, as well as those currently allowed. Having received no clear-cut answers to its questions, NHTSA will continue to monitor these issues and defers further action.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291, "Federal Regulation," or significant under Department of Transportation regulatory policies and procedures. A regulatory evaluation has been prepared and placed in the public docket. Since use of the proposed headlamps is optional, the rule will not impose additional requirements or costs but will permit manufacturers greater flexibility in use of headlighting systems.

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. The rule may have a small positive effect on the human environment since the weight and quantity of materials used in the manufacture of headlamps would be reduced.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule will not have a significant economic impact on a substantial number of small entities. Accordingly, no initial regulatory flexibility analysis has been prepared. Manufacturers of motor vehicle headlamps, those affected by this rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Finally, small organizations and governmental jurisdictions would not be significantly affected since the price of new vehicles, headlamps, and aimer adjusters will be minimally impacted.

Because of the necessity of vehicle, headlamp, and bulb manufacturers to plan production and distribution on an orderly basis, it is found that an effective date earlier than 180 days after issuance of the final rule is in the public interest.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

1. A new definition "Aiming Reference Plane" is added to Section S3 *Definitions* to read as follows:
"Aiming Reference Plane" means a plane which is perpendicular to the longitudinal axis of the vehicle and tangent to the forwardmost aiming pad on the headlamp.

2. The definition of "Replaceable Bulb Headlamp" in Section S3 *Definitions* is revised to read:
"Replaceable bulb headlamp" means a headlamp comprising a bonded lens and reflector assembly and one or two standardized replaceable light sources.

3. In paragraph S4.1.1.36 the word "two" is deleted.

4. In paragraph S4.1.1.36, the last sentence of paragraph (a)(2) is removed and the following four sentences added:
The lens of each replaceable bulb headlamp shall have three pads which meet the requirements of Figure 4. Except as provided in subparagraph (a)(3), a whole number, which represents the distance in tenths of an inch (i.e., 0.3 inch = 3) from the aiming reference plane to the respective aiming pads which are not in contact with that plane, shall be inscribed adjacent to each respective aiming pad on the lens. The height of these numbers shall be not less than .157 inch (4mm). If there is interference between the plane and the area of the lens between the aiming pads, the whole number will represent the distance to a secondary plane. The secondary plane shall be located paralled to the aiming reference plane and as close to the lens as possible without causing interference.

5. A new paragraph (a)(3) is added to paragraph S4.1.1.36 to read:

S4.1.1.36(a)(3) If the most forward aiming pad is the lower inboard aiming pad, then the dimensions may be placed anywhere on the lens. The dimension for the outboard aiming pad (Dimension F in Figure 4) shall be followed by the letter "H" and the dimension for the center aiming pad shall be followed by the letter "V". The dimensions shall be expressed in tenths of an inch.

6. Paragraph (b) of paragraph S4.1.1.36 is revised to read:

(b) Each replaceable bulb headlamp shall be designed to conform to the following sections of the specified SAE Standards and Recommended Practices with any standardized replaceable light source intended for use in such headlamp.

7. Paragraph (b)(2) of paragraph S4.1.1.36 is revised to read:

(2) Section 3.1—Test Voltage, and Section 3.5—Photometric Design Requirements, excluding Table 2, of SAE J579c "Sealed Beam Headlamp Units for Motor Vehicles" December 1978. The term "aiming plane" in paragraph 3.5 of SAE J579c shall mean "aiming reference plane."

8. Paragraphs (A) and (B) of paragraph S4.1.1.36 (d)(6) are revised by removing the words "mechanical axis" and replacing them with "axis of each replaceable light source."

9. A new paragraph (e) is added to S4.1.1.36 to read:
(e)(1) There shall be no mechanism that allows adjustment of an individual standardized replaceable light source or adjustment of reflector aim on a headlamp with two standardized replaceable light sources.

(2) Lower beam photometrics shall be provided by a filament designed with an average life of 320 hours.

(3) The lower and upper beams of a headlamp system consisting of two lamps, each containing two standardized replaceable light sources, shall be provided as follows:

(i) The lower beam shall be produced in one of the following ways:

(A) By the outboard light source (or the upper one if arranged vertically), designed to conform to the lower beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978; or

(B) By both light sources, designed to conform to the lower beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source, (or the lower one if arranged vertically) designed to conform to the upper beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978; or

(B) By both light sources, designed to conform to the upper beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1976.

(iii) Each such headlamp manufactured as replacement motor vehicle equipment shall be designed to meet the requirements of paragraphs (e)(3)(i) and (e)(3)(ii) of this section.

(4) The lower and upper beams of a headlamp system consisting of four lamps, each containing a single standardized replaceable light source, shall be provided as follows:

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978. The lens of each such headlamp shall be permanently marked with the letter "L".

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978. The lens of each such headlamp shall be permanently marked with the letter "U".

(iii) Each such headlamp manufactured as replacement motor vehicle equipment shall be designed to meet the requirements of paragraphs (e)(4)(i) and (e)(4)(ii) of this section.

10. New paragraphs S4.5.8, S4.5.9, and S4.5.10 are added to read:

S4.5.8 The lower and upper beams of a headlamp system consisting of four lamps, each containing a single standardized replaceable light source, shall not be activated simultaneously, except momentarily for temporary signaling use.

S4.5.9 The wiring harness or connector assembly of a replaceable bulb headlamp with two standardized bulbs or a four-lamp replaceable bulb headlamp system shall be designed so that the filaments not intended to be used with the lens prescription in front of such filament shall not be illuminated.

S4.5.10 The filaments in a dual-filament standardized replaceable light source shall not be activated simultaneously except momentarily when switching between beams, or for temporary signaling use.

11. Paragraph S4.1.1.37 is revised to read:

S4.1.1.37 Each lens-reflector unit manufactured as replacement equipment for a replaceable bulb headlamp system shall be designed to conform to the requirements of S4.1.1.36 when any standardized replaceable light source is inserted in it.

12. Paragraph S4.1.1.39 and paragraph S8 are removed.

13. Paragraphs S6.7 and S6.8 are revised to read:

S6.7 *Temperature and internal heat tests*—A headlamp with one replaceable standardized light source shall be tested according to S6.7.1(a) and S6.7.2(a). A headlamp with two standardized replaceable light sources shall be tested according to S6.7.1(b), S6.7.1(c), S6.7.2(b), and S6.7.2(c).

S6.7.1 *Temperature cycle.*

S6.7.1(a) *Test for a headlamp with one standardized replaceable light source.* A headlamp, mounted on a headlamp test fixture, shall be exposed to 10 complete consecutive thermal cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the highest combination of filament wattages such as upper beam, fog lamp, parking lamp, and turn signal lamp, that are intended to be used simultaneously in the headlamp, shall be energized at design voltage commencing at point "A" of Figure 6 and deenergized at point "B". If a turn signal is provided, for test purposes it shall flash at 90 flashes per minute with a 75±2% current "on time." Separate or single test chambers may be used to separate the temperature environment described by the thermal cycle profile. All drain holes, breathing devices or other designed openings of the headlamp shall be in their normal operating positions.

(b) *Test for the lower beam of a headlamp with two standardized replaceable light sources.* A headlamp mounted on a headlamp test fixture, shall be exposed to 10 complete consecutive thermal cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the highest combination of filament wattages such as fog lamp, parking lamp, and turn signal lamp, that are intended to be used simultaneously in the headlamp when operating on lower beam shall be energized at design voltage commencing at point "A" of Figure 6 and deenergized at point "B". If a turn signal is provided, for test purposes it shall flash at 90 flashes per minute with a 75±2% current "on time." Separate or single test chambers may be used to separate the temperature environment described by the thermal cycle profile. All drain holes, breathing devices or other designed openings of the headlamp shall be in their normal operating positions.

(c) *Test for the upper beam of a headlamp with two standardized replaceable light sources.* A headlamp mounted on a headlamp test fixture shall be exposed to 10 complete consecutive thermal cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the highest combination of filament wattages such as fog lamps, parking lamps, and turn signal lamps, that are intended to be used simultaneously when the headlamp is operating on upper beam shall at design voltage be energized simultaneously commencing at point "A" of Figure 6 and deenergized at point "B". If a turn signal is provided, for test purposes it shall flash at 90 flashes per minute with a 75±2% current "on time." Separate or single test chambers may be used to generate the temperature environment described by the thermal cycle profile. All drain holes, breathing devices or other designed openings of the headlamp shall be in their normal operating position.

S6.7.2 *Internal Heat Test.*

(a) *Test for a headlamp with one standardized replaceable light source.*

(1) The lens surface of the headlamp that would normally be exposed to road dirt shall be sprayed uniformly with any appropriate mixture of dust and water or other material to reduce the photometric output at the test point H-V of the upper beam (or at the 1/2 °D-1/2 °R test point for lower beam if the headlamp is an "L" headlamp in a four-lamp system) to 25±2% of the output originally measured in the upper beam photometric test under S4.1.1.36(b). Such reduction shall be determined under the same conditions under which the original measurement was made.

(2) After the determination has been made that the photometric output of the lamp has been reduced as specified in S6.7.2(a)(1), the lamp and its mounting hardware shall be mounted in an environmental test chamber in the manner similar to that indicated in Figure 7 "Dirt-Ambient Test Setup." The headlamp shall be soaked for one hour at a temperature of 95+7-0 °F (35+4-0 °C) and then the highest combination of filament wattages that are intended to be used simultaneously when operating on upper beam (or lower beam for an "L" lamp headlamp) shall be energized for one hour in a still air condition, allowing the temperature to rise from 95 °F (35 °C).

(3) The lamp shall be returned to a room ambient temperature of 73+7-0 °F (23+4-0 °C) and relative humidity of 30±10%. The lens shall then be cleaned. Photometric output of the lamp shall be determined according to S6.1.

(b) *Test of the lower beam of a headlamp with two standardized replaceable light sources.*

(1) The lens surface of the headlamp that would normally be exposed to road dirt shall be sprayed uniformly with any appropriate mixture of dust and water or other material to reduce the photometric output at the test point 1/2 °D-1 1/2 °R or the lamp to 25±2% of the output originally measured in the lower beam photometric test under S4.1.1.36(b). Such reduction shall be determined under the same conditions under which the original measurement was made.

(2) After the determination has been made that the photometric output of the lamp has been reduced as specified in S6.7.2(b)(1), the lamp and its mounting hardware shall be mounted in an environmental test chamber in the manner similar to that indicated in Figure 7 "Dirt-Ambient Test Setup." The headlamp shall be soaked for one hour at a temperature of 95+7-0+F

(35+4-0 °C) and then the highest combination of filament wattages that are intended to be used simultaneously when operating on lower beam shall be energized simultaneously for one hour in a still air condition, allowing the temperature to rise from 95 °F (35 °C).

(3) The lamp shall be returned to a room ambient temperature 73+7-0 °F (23+4-0 °C) and relative humidity of 30±10%. The lens shall then be cleaned. The photometric output of the lamp on lower beam shall then be determined according to S6.1.

(c) *Test of the upper beam of a headlamp with two standardized replaceable light sources.*

(1) The lens surface of the headlamp that would normally be exposed to road dirt shall be sprayed uniformly with any appropriate mixture of dust and water or other material to reduce the photometric output at the test point H-V of the lamp to 25±2% of the output originally measured in the upper beam photometric test under S4.1.1.36(b). Such reduction shall be determined under the same conditions under which the original measurement was made.

(2) After the determination has been made that the photometric output of the lamp has been reduced as specified in S6.7.2(c)(1), the lamp and its mounting hardware shall be mounted in an environmental test chamber in the manner similar to that indicated in Figure 7 "Dirt-Ambient Test Setup." The headlamp shall be soaked for one hour at a temperature of 95+7-0 °F (33+4-0 °C) and then the highest combination of filament wattages that are intended to be used simultaneously when operating on upper beam shall be energized simultaneously for one hour in a still air condition, allowing the temperature to rise from 95 °F (35 °C).

(3) The lamp shall be returned to a room ambient temperature of 73+7-0 °F (23+4-0 °C) and relative humidity of 30+*10•. The lens shall then be cleaned. The photometric output of the lamp on the upper beam shall be determined according to S6.1.*

S6.8 Humidity. The headlamp mounted on a test fixture shall be placed in a controlled environment consisting of a temperature of 100+7-0 °F (38+*4-0* °C) with a relative humidity of not less than 90%. All drain holes, breathing devices, and other designed openings shall be in their normal operating positions. The headlamp shall be subjected to 20 consecutive 6-hours test cycles. In each cycle, it shall be energized for 1 hour at design voltage with the highest combination of filament wattages that are intended to be used and then deenergized for 5 hours. If the turn signal is provided, fokr test purposes it shall flash at 90 flashes per minute with a 75±2% current "on time." After completion of the last cycle, the lamp shall be soaked for 1 hour at 73+7-0 °F (20+4-0 °C) and relative humidity of 30±10% before it is removed for photometric testing. The headlamp shall be tested for photometrics at 10±1 minutes following completion of the humidity test.

14. In the Table II, under the column heading, "multipurpose passenger vehicles, trucks, and buses", the entry for the item "headlamps" is revised to read as follows:

Headlamps providing the upper beam at the same height, 1 on each side of the vertical centerline; headlamps providing the lower beam, at the same height, 1 on each side of the vertical centerline, as far apart as practicable. If a single lower beam light source is used in a headlamp with two standardized replaceable light sources, it shall be the farthest light source from the vertical centerline.

15. In Table IV, under the column heading, "Passenger cars, multipurpose passenger vehicles, trucks, and buses", the entry for the item "headlamps" is revised to read as follows:

Headlamps providing the upper beam at the same height, 1 on each side of the vertical centerline; headlamps providing the lower beam, at the same height, 1 on each side of the vertical centerline, as far apart as practicable. If a single lower beam light source is used in a headlamp with two standardized replaceable light sources, it shall be the farthest light source from the vertical centerline.

16. Fiqure 4-1 is revised as follows:

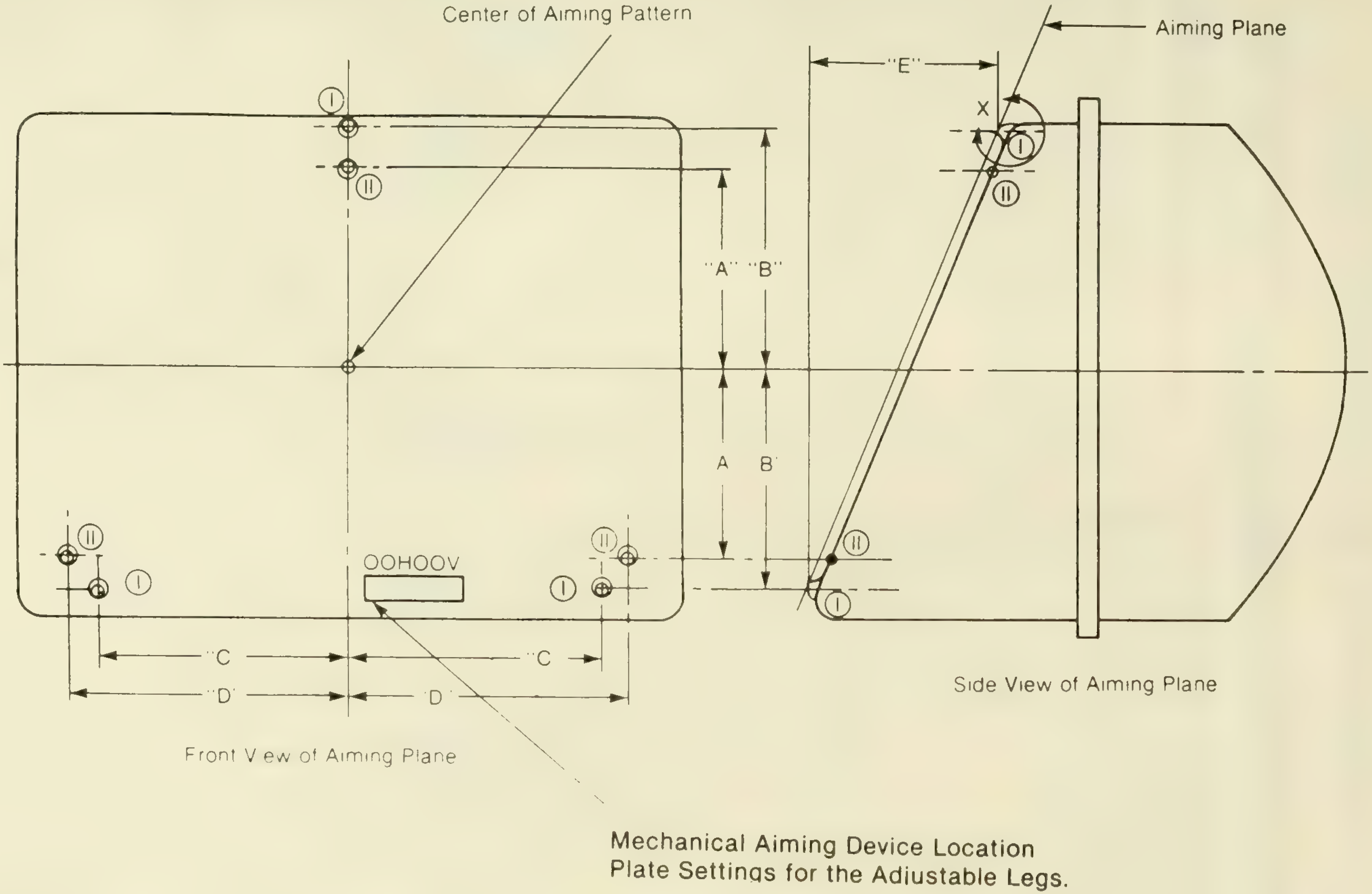

Center of Aiming Pattern
Aiming Plane
"E"
X
I
II
"A"
"B"
A
B'
"C
"D'
OOHOOV
Front View of Aiming Plane
Side View of Aiming Plane
Mechanical Aiming Device Location
Plate Settings for the Adjustable Legs.

Figure 4-1. Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units

17. The title of Figure 4-2 is amended by removing the words "Dimensional * * * Units" from the heading.

18. In Figure 4-4 Dimension G and its dimensions in inches and millimeters are deleted.

19. In Figure 7 the width of the Block Box is changed from "16W" to "24W".

20. Figures 9-1 and 9-2 are removed.

Issued on May 17 1985

Diane K. Steed
Administrator

50 F.R. 21052
May 22, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment; Correction and Clarification
[Docket No. 83-12; Notice 4]

ACTION: Final rule; correction and Clarification.

SUMMARY: This notice corrects an error in the amendment published on November 26, 1984 (49 FR 46386) relating to lamps, reflective devices and associated equipment. The error appears in Figure 1b. It is therefore necessary to correct the error. The maximum allowable value for parking lamp candlepower was omitted. Clarifications of Figure 1b are also provided.

SUPPLEMENTARY INFORMATION: In the final rule on harmonization amendments published on November 26, 1984 (49 FR 46386), in establishing Figure 1b to provide minimum and maximum candlepower values for certain lamps, the maximum allowable candlepower for parking lamps was inadvertently omitted and must now be reinstated. That value is 250 candela at test points below the horizontal and 125 canaela or above horizontal as specified by SAE Standard J222, December 1970, and is incorporated by reference in Standard No. 108. Footnotes clarifying requirements for taillamps and fron yellow turn signals are also added.

⁸ 571.108 [Amended]

1. The authority citation for Part 571 continues to read as follows.

15 U.S.C. 1392, 1407; delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.

2. On page 46390, Figure 1b 49 CFR 571.108 is revised as follows.

Lamp	Lighted Sections		
	1	2	3
Stop	80/300	95/360	110/420
Tail[1]	2/18	3.5/20	5.0/25
Parking[2]	4.0/125	-	-
Red Turn Signal	80/300	95/360	110/420
Yellow Turn Signal Rear	130/750	150/900	175/1050
Yellow Turn Signal Front	200/-	240/-	275/-
Yellow Turn Signal Front[3]	500/-	600/-	685/-

Figure 1b—Minimum and maximum allowable candlepower values.

1. Maximum at H or above.

2. The maximum candlepower value of 125 applies to all test points at H or above. The maximum allowable candlepower value below H is 250.

3. Values apply when the optical axis (filament center) of the front-turn signal is at a spacing less than 4 in. (10 cm.) from the lighted edge of the headlamp unit providing the lower beam, or from the lighted edge of any additional lamp installed as original equipment or used in lieu of the lower beam.

Issued on May 22, 1985

Barry Felrice
Associate Administrator
for Rulemaking

50 F.R. 21619
May 28, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO 108

Lamps, Reflective Devices and Associated Equipment; Clarifications
[Docket No. 83-12; Notice 5]

ACTION: Final rule; clarifying amendments.

SUMMARY: This notice clarifies the rule published on November 26, 1984 (49 FR 46366), relating to lamps, reflective devices, and associated equipment through non-substantive amendments to paragraph S4.1.1.11 and Figure 1a.

EFFECTIVE DATE: June 6, 1985

SUPPLEMENTARY INFORMATION: Following publication of the harmonization amendments to Standard No. 108 on November 26, 1984 (49 FR 46366), the agency received several requests for clarification. After due consideration, it has decided that clarification is best provided by non-substantive amendments to the provisions in question.

The harmonization amendments substituted new paragraphs S4.1.1.11 and S4.1.1.12 for the old ones, requiring new Figures 1a, 1b, and 1c, to replace former Figure 1. With respect to motorcycle turn signal lamps, the values of Figure 1b have been substituted for those specified in paragraph S4.1.1.30 (which was unchanged and which allowed alternative compliance with either one-half of certain SAE values, or those of Figure 1). This means that S4.1.1.30 has been superseded, is technically incorrect, and may be eliminated from the standard. However, because new paragraph S4.1.1.11 has omitted stating that motorcyle turn signal lamps need meet only one-half the sums given in Figure 1b, the impression has been created that the grouped minimum candlepower method for testing motorcycle turn signal lamps is no longer available.

The agency intended no change in this requirement. NHTSA is therefore amending paragraph S4.1.1.11 to correct the misimpression, and to delete paragraph S4.1.1.30.

Paragraph S4.1.1.11 also references values in Figures 1a and 1b that are substituted for those in Table 1 of SAE "J585e Taillamps (at H or above)". The agency intended to state "(Maximum at H or above)", an omission which could create confusion and is now being corrected.

Finally a footnote is being added to Figure 1a to clarify that values shall be truncated after one digit to the right of the decimal point. For example, 95 cd x 12.6% = 11.875 cd, but the value to use is 11.8 cd, dropping the last two digits. The Figure is also being changed graphically to assure easier reading of the test grid percentages.

Because these amendments are non-substantive and provide clarifications, it is hereby found for good cause shown that notice and comment are unnecessary and an effective date earlier than 180 days after issuance is in the public interest. The amendments are effective upon publication in the *Federal Register*.

Sec. 571.108 [Amended]

The authority citation for Part 571 continues to read as follows:

1. The last sentence in paragraph S4.1.1.11 is revised to read:

S.1.1.11 ". . .The values specified in Figure 1a and Figure 1b are substituted for those specified in Table 1 of the following SAE Standards: J222 *Parking Lamps*, J585e *Taillamps* (maximum at H or above), J585c *Stop Lamps*, and J588e *Turn Signal Lamps*, except that motorcycle turn signal lamps need meet only one-half of the minimum photometric values specified in Figure 1b".

2. Paragraph S4.1.1.30 is deleted.

3. Figure 1a is revised as follows:

Test points (deg)		Turn Signal	Stop	Parking	Tail
10U, 10D......	5L, 5R	20	20	20	20
5U, 5D.......	20L, 20R	12.5	12.5	10	15
	10L, 10R	37.5	37.5	20	40
	V	87.5	87.5	70	90
H...........	10L, 10R	50	50	35	40
	5L, 5R	100	100	90	100
	V	100	100	100	100

Figure 1a—Required percentage of minimum candlepower of Figure 1b.

Minimum design candlepower requirements are determined by multiplying the percentage given in this Figure by the minimum allowable candlepower values in Figure 1b. The resulting values shall be truncated after one digit to the right of the decimal point.

Issued on May 30, 1985

Barry Felrice
Associate Administrator
for Rulemaking

50 F.R. 23813
June 6, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards; Lamps, Reflective Devices, and Associated Equipment
[Docket No. 82-16; Notice 4]

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 108 to allow installation of modulating headlamps on motorcycles. Such a headlamp, whose use is currently not allowed, could improve conspicuity of a motorcycle and its operator during daylight. The rule completes agency action following the agency's grant of a petition by Harley-Davidson Motor Co., Inc. A notice of proposed rulemaking (NPRM) was published on August 28, 1984, which was a revision of the notice of proposed rulemaking published on September 23, 1982. Although the notice also proposed amending Safety Standard No. 123 to establish location and operation requirements for headlamp modulator switches for new motorcycles on which modulating headlamps have been installed as original equipment, this proposal has not been adopted.

EFFECTIVE DATE: August 21, 1985.

SUPPLEMENTARY INFORMATION: Paragraph S4.6(b) of Standard No. 108 requires headlamps to be steady-burning when in use although allowing them to be flashed automatically for signalling purposes. This paragraph allows cycles of activation and deactivation of the headlamp but it has not been interpreted as allowing cycles of varying intensity (modulation).

Harley-Davidson Motor Co., Inc., of Milwaukee, a manufacturer of motorcycles, wished to introduce headlamp modulation as an option and petitioned the agency for an amendment to Standard No. 108 to allow it. The agency granted the petition and published an NPRM on September 23, 1982 (Notice 1, 47 FR 42009), later extending the time in which to comment (Notice 2, 47 FR 47896) upon petition by the American Motorcycle Association. A revised NPRM was published on August 28, 1984 (Notice 3, 49 FR 34050).

Background of 1982 NPRM

In 1979, on behalf of the agency, the Highway Safety Research Institute evaluated various means of increasing the conspicuity of motorcycles and their operators (DOT-HS-805143). More than 30 types of conspicuity treatments were developed. Three principal means of improvement were found. One was the wearing by the cyclist of a high visibility vest and helmet cover. Another was continual operation of the low beam of the headlamp during daylight (it is now the practice of virtually all cycle manufacturers to wire the headlamp so that it is on when the engine is running). The third was modulation of the upper beam of the headlamp from full to low intensity at three times per second. Data show that about 75 percent of motorcycle accidents occur in daytime. Therefore, enhancement of conspicuity during daylight hours is manifestly in the interests of motor vehicle safety. For this reason and because some State legislatures have shown interest in allowing modulated headlamps on their highways, NHTSA tentatively concluded that cyclists should be afforded an option to choose a headlamp wired to modulate on the upper beam from higher to lower intensity at a pulse rate from 150 to 240 cycles per minute.

The agency particularly solicited comments from States, and from individuals who had used these lamps. Emphasis was placed on whether there was a potential for misuse; for example, the likelihood of use of the modulating mode under conditions such as inclement weather or dusk when the steady-burning mode is required for safety.

Comments on 1982 NPRM

Over 150 comments were received on the initial NPRM, of which only 17 could be characterized as objecting to the proposal. The principal comments in opposition were submitted by the States of Maryland and Minnesota. Each raised the possibility that a motorcycle with a modulating white headlamp might be perceived as a potential emergency vehicle, since flashing white lights in those States are generally reserved for emergency vehicles. Maryland commented that a mixture of motorcycles with and without headlamps would compound the potential for confusion. It suggested mandatory usage of a measure other than modulating headlamps to enhance conspicuity. Minnesota asked for safeguards to prevent the modulator from being operated when steady-burning headlamps are required. Commenters also asked for an automatic fail-safe provision to allow headlamp use if the modulator or its circuit failed.

The issue of "photic driving" was raised by the Insurance Institute for Highway Safety, the National Society for the Prevention of Blindness, and others. This issue concerns potential adverse reactions in the central nervous system from regularly flashing lights, similar to epileptic seizures. These are termed "photic driving" and can occur in persons not otherwise prone to epilepsy. These commenters recommended that the agency determine whether modulating headlamps would cause a photic driving problem prior to permitting their use. Their main concern related to the rate of modulation that would be allowed. One commenter, the California Highway Patrol, suggested a rate between 200 and 280 cycles per minute, specified for use in that State.

A final group of commenters expressed concern that modulating headlamps would prove distracting to other drivers, either when viewed directly oncoming, or indirectly in rearview mirrors.

The agency gave lengthy consideration to all these comments and concluded that none of them justified termination of the rulemaking action. It also concluded that the standard should not be amended in the manner proposed, and that a further notice of proposed rulemaking would be required to implement the suggestions and allay the concerns expressed in the comments to the initial proposal.

The 1984 NPRM

The agency did not deem it likely that a modulating headlamp would be perceived as belonging to an emergency vehicle for several reasons. One is that usually there would be only one headlamp, or two closely spaced headlamps, flashing rather than a widely spaced pair as would be the case with an emergency vehicle. Also, emergency vehicles would normally have either red or blue flashing lights in addition to the flashing headlamps, which a motorcycle would not have. The modulated headlamp would also be substantially different than the white "strobe" lights that are used on emergency vehicles and which usually are intense, of short duration and flash at a higher rate than proposed for modulated headlamps. "Strobe" lights also have a sharp distinction between the "on" condition and the "off" condition whereas modulated headlamps make a gradual transition from a higher intensity to a lesser one.

NHTSA tentatively concurred with Minnesota's request for safeguards against misuse, and proposed, in essence, that any modulating system be automatically activated by ambient light so that when steady-burning headlamps are required (e.g., at night), the modulator could not be used. Also proposed was a requirement to prevent excessive voltage drops in the circuit caused by inferior switches. The limit for voltage drop was proposed at .45 volt.

The agency reviewed its proposed flash rate of 150 to 240 cycles per minute, and concluded that 150 cycles was too close to that of turn signals and hazard warning signals for its intended purpose. Because the State of California had specified 200 to 280 cycles per minute for 3 1/2 years with no apparent problems, the agency proposed a cycle rate of 240 ± 40 per minute.

With respect to the photic driving phenomenon, the agency tentatively concluded that modulating headlamps would cause no problem during daytime if a pulse rate of 4 per second (240 cycles per minute) were used. This conclusion was based upon two aspects of the phenomenon: the pulse rate of the light and the amount of contrast between the light and the background. From the available studies on the subject, it appeared that people are most likely to be affected if the light flashed at about 10 flashes per second (600 per minute) and/or when the background is very dark. Thus, modulation of headlamps at night within the proposed pulse rate could possibly produce a signal that is in the range of reported conditions that produce photic reactions. Accordingly, NHTSA proposed, in essence, that modulation be allowed only during daylight conditions. This could be accomplished through the use of a light sensor, which NHTSA believed could be incorporated into the system for less than $1.00. Specific comments were sought on the incremental cost of such a sensor. With such a device, headlamp modulation would cease when the level of ambient light falls below the normal daytime light level (or below the level of high intensity street lights). The sensor would be mounted either upward to measure direct light, from above the motorcycle, or downward to measure indirect light, reflected off the pavement beneath the motorcycle.

In developing this aspect of the proposal, NHTSA gave close attention to comments from Dotech, Inc., submitted to the docket on January 9, 1984, and April 30, 1984. Dotech had measured both incident light and reflected light levels from various types of street lighting in parking lots and on parkways at night to determine appropriate values for direct or reflected light to deactivate the modulator. Dotech found that incident light levels did not change significantly when it moved its light meter from waist level up and down several feet, while conducting direct light measurements under street lights located 30 feet above the pavement. Dotech initially concluded that the modulator sensor should have a vertical orientation to avoid light reflected from headlamps or other sources, and that appropriate values appeared to be 430 lux (40 foot-candles) of direct light, or 150 lux (13.9 foot-candles) of indirect reflected light. Subsequently, however, Dotech recommended 270 lux (25 foot-candles) for direct light and 60 lux (5.6 foot-candles) for reflected light as more appropriate based on its experiments. Accordingly, NHTSA proposed that modulator systems be equipped with a sensor which would deactivate the modulator whenever the light level appropriate for the sensor's orientation is reached. The upward or downward orientation of the sensor would be at the option of the manufacturer. The light source NHTSA proposed to use in its compliance test of the systems would be a tungsten filament lamp operating at 3000° Kelvin. Because of the dearth of comments in this area, other than that of Dotech, and because of Dotech's own modified conclusions, NHTSA was particularly interested in additional comments on the appropriateness of the values of direct and reflected light that is proposed.

There were also additional features that were not proposed in the initial notice that NHTSA proposed to incorporate into a modulating headlamp standard. The first of these was the proposal of a modulation depth limit to assure that not less than 17 percent of full luminous intensity is available regardless of lamp wattage. This would serve to prevent early bulb filament failure and to ensure that a distinction remains between the modulating headlamp and flashing strobe lights used on emergency vehicles, as well as lessening the likelihood of a "photic response".

To assure performance of the headlamp modulator, NHTSA proposed an accelerated environmental requirement comprised of a temperature and humidity test. NHTSA proposed to use the SAE Standard for vehicle hazard warning signal flashers, J945b, as a guide to thermal extremes, acceptable voltage variation and general procedure. Humidity exposure was added as were performance checks at each environmental extreme. The test duration proposed was 60 hours.

With respect to the aftermarket, NHTSA proposed only that each modulator be labelled with the maximum wattage for which it is intended. Some motorcycles, for example, may have two 70-watt headlamps while others may have a single 35-watt headlamp. The consumer must be provided information to determine whether a modulator is sufficient to drive high-wattage or multiple headlamps.

A companion amendment to Standard No. 123, *Motorcycle Controls and Displays*, was proposed for location and operation requirements for modulator switches on vehicles equipped by their manufacturers with modulating headlamps. The agency specifically invited comments on the location of the Modulate position on the Headlamp Beam Control Switch.

Comments on 1984 NPRM

Over 50 comments were received in response to the second NPRM, virtually all of which supported it and some of which suggested minor modifications and refinements that the agency has adopted.

The first significant issue raised was whether modulation might not be allowed on the lower beam (only the upper beam was proposed), with some commenters expressing the opinion that the lower beam modulation might be less irritating to oncoming drivers, as well as being consistent with the driving requirement of dimming upper beams when approaching other vehicles. Intuitively this comment has appeal and NHTSA has concluded that lower beam modulation should be permitted for the reasons discussed below.

In studies of daytime running lights, a value of 1500 candela has been found sufficient to demonstrate conspicuity of a passenger car more than a mile away. Therefore, the 3000 candela that most motorcycle headlamps have at the H-V test point would be more than sufficient for conspicuity. In addition, the requirement that the minimum intensity during modulation be not less that 17% of full-on intensity during modulation reduces the possibility that modulation will be less effective for conspicuity than a steady-burning lower beam.

There are additional factors in support of allowing modulation on the lower beam. An increasing number of motorcycles are being equipped with headlamps of greater wattage. For these motorcycles, use of the upper beam for modulation might create a glare problem. On the other hand, smaller motorcycles with headlamps of no greater output than 35 watts may find an upper beam modulator more effective. Based upon the comments, NHTSA has decided to allow modulation on either the upper or lower beam, at the manufacturer's option. The headlamp would not be permitted to modulate on the beam not chosen, and therefore, the operator would not be able to switch the beam for which modulation was produced by the manufacturer. NHTSA also proposed that the modulator be equipped with a sensor that would activate and deactivate it. Comments were generally directed to factors which might impair satisfactory operation of the sensor, such as mounting in a shielded location where light might not reach it, or in a location where it could be obscured by dirt. The effect of either of these factors would be to deactivate the device at a time when it should be functioning. No further comments were received on the issue of photic driving.

Harley-Davidson expressed particular concern that the reliability of the sensor would be reduced by the addition of components to provide the light sensing functions, raising the possibility that if it failed in one mode it might not operate at all, but that failure in another would cause continuous operation. Further, comments were made to the effect that a manufacturer of a modulator, Dotech, had applied for patents that cover the construction of the light sensor and that NHTSA might be in the position of having written a standard that mandated a design that was under the monopoly control of the patent holder. NHTSA has reviewed these comments. The manual by-pass switch required for these systems will assure the restoration of normal operation in the event of a malfunction in the modulator. Further, the humidity-temperature test that was proposed and now adopted will insure system reliability. Although Dotech has applied for patents, it is only one manufacturer of modulating devices. While Dotech uses a light sensing transistor for a light detector, a number of other types of light sensors can be used, such as solar cells and light dependent resistors.

The notice proposed a maximum allowable voltage drop of .45 volt across the modulator during operation. Koito commented that it was impossible to meet this requirement with high wattage headlamps since the voltage drop across the transistor is increased. Koito recommended 1.5 volts, or, alternatively no requirement. The suggested 1.5 volt value is unacceptable to the agency as it could result in a reduction to 65% of normal intensity during nighttime when the lights are steady-burning. NHTSA is aware of transistor switches which are available which can handle power requirements without excessive voltage drop. Another possible solution to the problem is the use of mechanical relays in a hybrid circuit with switch transistors. Therefore NHTSA has adopted the proposed voltage drop of .45.

Part of the proposed temperature-humidity test involves operation of the modulator at -25 °F for three hours. Some commenters objected to the temperature arguing that few will ride their motorcycles at such an extremely low temperature. The agency wishes to insure that modulators remain operative when subjected to temperatures of the sort that have been experienced through wide areas of the United States during winters in the past ten years. Motorcycles may be exposed to this extreme at times other than when in use; for example, when parked overnight. Current SAE standards on flashers and switches require operation at -25 °F and the proposed test values were taken from these SAE requirements which reflect industry capability and practice. The agency understands that modulators can operate at this temperature, and is therefore adopting the value as proposed.

NHTSA also proposed that the headlamp dimmer switch incorporate a modulator position when this feature is offered as original equipment. Two commenters indicated that frequent use of the modulator switch is not required, and that it does not have to be as accessible as the upper-lower beam switch. In addition, the requirement would not cover the switch for aftermarket modulators.

For these reasons, NHTSA has not adopted the position indicator proposal, nor the companion proposal to amend Safety Standard No. 123 to identify the modulator position.

NHTSA has considered the impacts of this rule and has determined that it is neither major within the meaning of Executive Order 12291 nor significant under Department of Transportation guidelines regarding regulatory policy and procedure. The rule will have an impact only on those who voluntarily choose to produce and buy an alternative headlamp. Because the modulating headlamp will not be required but is simply an option to a standard motorcycle headlamp, there will be no mandatory increased manufacturing costs connected with this proposal. The cost to the purchaser who chooses a headlamp with a modulating switch would be about $40. However, since this feature would presumably be desired only by those purchasers who selected it as an option, NHTSA does not anticipate any impact on motorcycle sales. The impacts of this rule are so minimal that preparation of a regulatory impact analysis or a full regulatory evaluation is not warranted.

NHTSA has analyzed this rule for the purpose of the National Environmental Policy Act, and has determined that it would not have a significant effect on the human environment since neither the weight not quantity of materials used in the manufacture of the lamps is greatly affected.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule would not have a significant economic impact on a substantial number of small entities. Accordingly, the agency has not prepared a flexibility analysis. Manufacturers of motorcycle headlamps and modulators, those affected by the proposal, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Further, compliance with the adopted changes is optional. Small organizations and governmental jurisdictions would be affected only to the extent that law enforcement agencies chose to purchase motorcycles with modulating headlamps.

Because the amendment relieves a restriction and does not impose a burden upon any party, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest, and its amendment is effective 30 days after publication in the Federal Register.

The engineer and attorney primarily responsible for this notice are Jere Medlin and Taylor Vinson, respectively.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, Motor vehicle equipment, Lamps-reflective devices and associated equipment.

PART 571—FEDERAL MOTOR VEHICLE SAFETY STANDARDS

In consideration of the foregoing, 49 CFR 571.108 is amended as follows:

§ 571.108 [Amended]

1. The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

2. Paragraph S4.6 is redesignated S4.5.11 and revised to read:

S4.5.11 The wiring requirements for lighting equipment in use are:

(a) Turn signal lamps, hazard warning signal lamps, and school bus warning lamps shall be wired to flash;

(b) High-mounted stop lamps on passenger cars manufactured on or after August 1, 1984, but before September 1, 1986, may flash when the hazard warning system is activated;

(c) Headlamps and side marker lamps may be wired to flash for signalling purposes;

(d) A motorcycle headlamp may be wired to allow either its upper beam or its lower beam, but not both, to modulate from a higher intensity to a lower intensity in accordance with section S4.6;

(e) All other lamps shall be wired to be steady-burning.

3. A new section S4.6, *Motorcycle headlamp modulation system* is adopted to read:

S4.6 *Motorcycle headlamp modulation system.*

S4.6.1 A headlamp on a motorcycle may be wired to modulate either the upper beam or the lower beam from its maximum intensity to a lesser intensity provided that:

(a) The rate of modulation shall be 240±40 cycles per minute.

(b) The headlamp shall be operated at maximum power for 50 to 70 percent of each cycle.

(c) The lowest intensity at any test point shall be not less than 17 percent of the maximum intensity measured at the same point.

(d) The modulator switch shall be wired in the power lead of the beam filament being modulated and not in the ground side of the circuit.

(e) Means shall be provided so that both the lower beam and upper beam remain operable in the event of a modulator failure.

(f) The system shall include a sensor mounted with the axis of its sensing element perpendicular to a horizontal plane. Headlamp modulation shall cease whenever the level of light emitted by a tungsten filament light operating at 3000° Kelvin is either less than 270 lux (25 foot candles) of direct light for upward pointing sensors or less than 60 lux (5.6 foot-candles) of reflected light for downward pointing sensors. The light is measured by a silicon cell type light meter that is located at the sensor and pointing in the same direction as the sensor. A Kodak Gray Card (Kodak R-27) is placed at ground level to simulate the road surface in testing downward pointing sensors.

(g) When tested in accordance with the test profile shown in Figure 9, the voltage drop across the modulator when the lamp is on at all test conditions for 12 volt systems and 6 volt systems shall not be greater that .45 volt. The modulator shall meet all the provisions of the standard after completion of the test profile shown in Figure 9.

(h) Means shall be provided so that both the lower and upper beam function at design voltage when the headlamp beam control switch is in either the lower or upper beam position when the modulator is off.

S4.6.2(a) Each motorcycle headlamp modulator not intended as original equipment, or its container, shall be labelled with the maximum wattage, and the minimum wattage, appropriate for its use. Additionally, each such modulator shall comply with S4.6.1 (a) through (g) when connected to a headlamp of the maximum rated power and a headlamp of the minimum rated power and shall provide means so that the modulated beam functions at design voltage when the modulator is off.

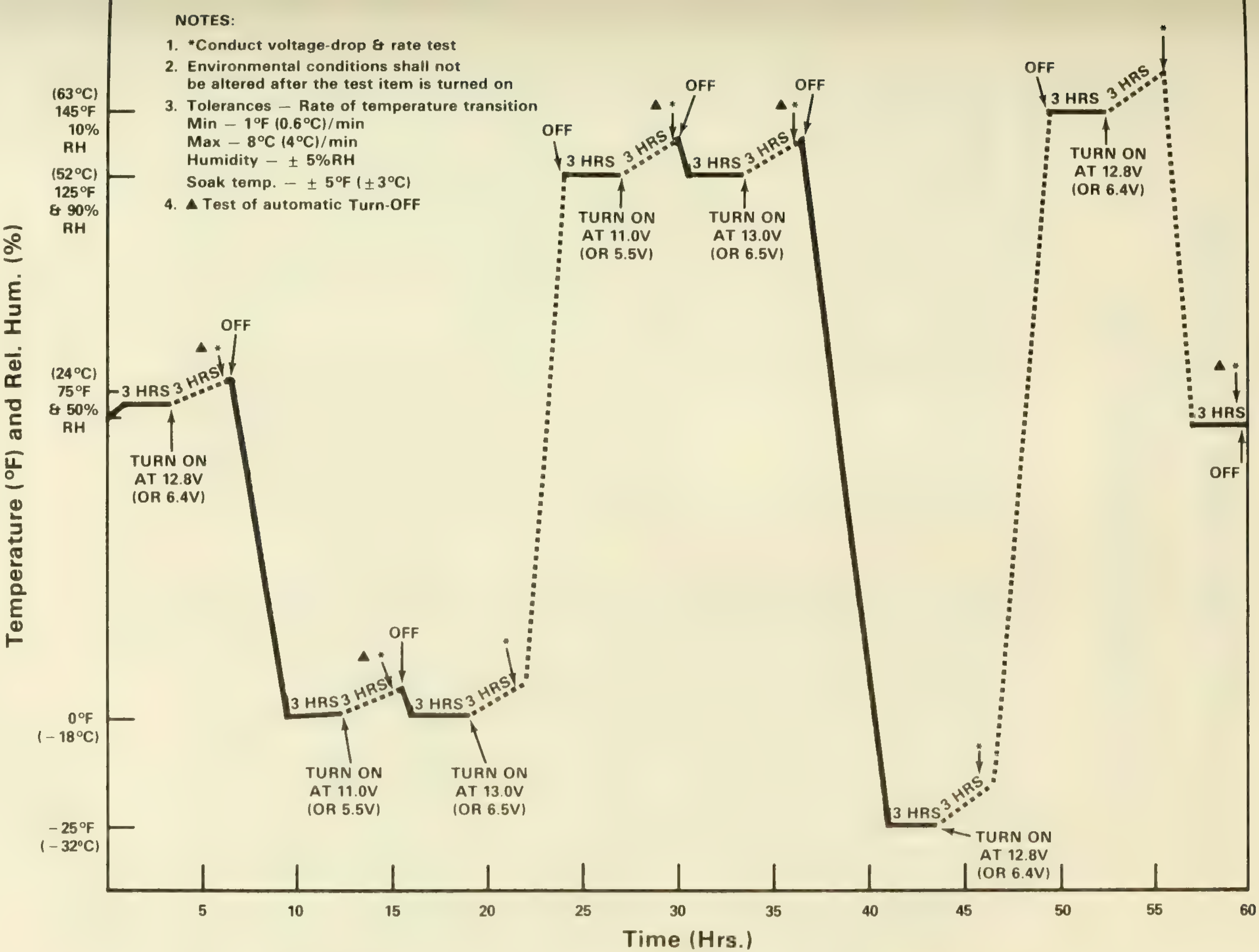
(b) Instructions, with a diagram, shall be provided for mounting the light sensor including location on the motorcycle, distance above the road surface, and orientation with respect to the light.

4. A new Figure 9 would be added as follows:

Issued on July 16, 1985

Diane K. Steed
Administrator

50 F.R. 29676
July 22, 1985



NOTES:

1. *Conduct voltage-drop & rate test
2. Environmental conditions shall not be altered after the test item is turned on
3. Tolerances — Rate of temperature transition
   Min — 1°F (0.6°C)/min
   Max — 8°C (4°C)/min
   Humidity — ± 5%RH
   Soak temp. — ± 5°F (±3°C)
4. ▲ Test of automatic Turn-OFF

Figure 9

Temperature-Humidity Environmental Test Profile

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Federal Motor Vehicle Safety Standards;
Lamps, Reflective Devices, and Associated Equipment
[Docket No. 82-04; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 108 to provide an alternate location for front identification lamps on multipurpose passenger vehicles, trucks and buses whose overall width exceeds 80 inches. The rule allows them to be mounted on the top of the cab instead of "as close as practicable to the top of the vehicle." This action completes rulemaking on a petition by the Truck Body and Equipment Association.

EFFECTIVE DATE: October 12, 1985

SUPPLEMENTARY INFORMATION: Paragraph S4.1.1 and Table I of 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, requires trucks, multipurpose passenger vehicles, and buses of 80 or more inches overall width to be equipped with a series of three identification lamps mounted on the front and rear of the vehicle. According to Table II of Standard No. 108, this location must be "as close as practicable to the top of the vehicle." The Truck Body and Equipment Association (TBEA) petitioned for an amendment that would allow front identification lamps to be mounted, as an alternative, on the cab. In TBEA's view, safety would not be reduced since the lamps would still perform their function of identifying the presence of large vehicles in the roadway, and clearance lamps would still mark the height and width of the vehicle. It argued that an analogous precedent was found in paragraph S4.3.1.6 which allows clearance lamps to be mounted on the cab of a truck tractor to indicate overall width of the cab rather than the vehicle. To allow identification lamps also to be mounted on the cab will, in TBEA's opinion, reduce manufacturing costs.

A notice of proposed rulemaking on this subject was published on February 22, 1982, and an opportunity afforded for comment (47 FR 7711).

Nine comments were received on the proposal, six of them directly supporting it. The three remaining comments were directed towards an alleged necessity for a general review of requirements for identification lamps. Motor Vehicle Manufacturers Association and American Trucking Association commented that in their view no safety basis existed for evaluating the proposal. Wisconsin Electric Power Company suggested that the lamps could be eliminated.

The agency did not consider elimination of the identification lamps, convinced that they are needed on larger vehicles to indicate their presence on narrow or congested roads, curves, and during inclement weather, in order to afford other motorists a cue to vehicle size, assisting them in avoiding accidents.

Those supporting the proposal pointed out that tractor-trailers are required to have identification lamps on the truck tractor cab, but not on the trailer, and therefore the cab is an appropriate location for them. Further, there is a potential for a small cost savings. Many chassis-cab manufacturers install identification lamps on the cab. If the body mounted to it is higher than the cab, the final-stage manufacturer must now add an additional set of identification lamps to meet the requirement that they be located "as close as practicable to the top of the vehicle." Implementation of the proposal will relieve the final-stage manufacturer of the necessity of adding identification lamps when they are already on the chassis-cab. This would serve to reduce costs where this manufacturing practice is being followed.

NHTSA has decided to adop the proposal. In recognition of the fact that many manufacturers may wish to avail themselves of this option on a regular basis, NHTSA is amending Table II to specify that mounting the identification lamps as close as practicable to the top of the cab is an alternate location rather than one which is only an exception to the general rule that such lamps be mounted as close as practicable to the top of the vehicle.

Potential Benefits, Costs and Other Impacts

The primary benefit attributable to implementation of the rule is the slight reduction in the cost of manufacturing which petitioner believes will occur. Because identification lamps are presently required, there will be no increased manufacturing cost connected with this rule. NHTSA has considered the impacts of this rule and has determined that it is neither major within the meaning of E.O. 12291 nor significant under Department of Transportation guidelines regarding regulatory policy and procedure. The rule will have an impact only on those who voluntarily change their lighting systems from one location to another. The impacts are so minimal that preparation of a regulatory evaluation is not warranted. This rule would not have a significant effect on the human environment since neither the weight nor quantity of materials used in the manufacture on installation of the lamps is affected. Further, no impact on safety is anticipated. I certify that this rule would not have a significant economic impact on a substantial number of small entities. Manufacturers of motor vehicles and chassis-cabs, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Further, those effects would not be significant given the minimal cost reductions associated with the rule.

Finally, small organizations and governmental jurisdictions will not be significantly affected since the price of new vehicles will be minimally impacted.

Because the rule relieves a restriction and imposes on additional burdent on any person, it is hereby found for good cause shown that an effective date earlier that 180 days after issuance is in the public interest. The admendment is effective 30 days after its publication in the *Federal Register.*

In consideration of the foregoing, Table II of 49 CFR 571.108 is amended as follows:

TABLE II—LOCATION OF REQUIRED EQUIPMENT

Multipurpose Passenger Vehicles, Trucks, Trailers, and Buses, of 80 or More Inches Overall Width

Item	Location on— Multipurpose passenger vehicles, trucks, and buses	**	*
*	* *	*	*
Identification lamps	On the front and rear—3 lamps, amber in front, red in rear, as close as practicable to the top of the vehicle, at the same height, as close as practicable to the vertical centerline, with lamp centers spaced not less than 6 inches or more than 12 inches apart. Alternatively, the front lamps may be located as close as practicable to the top of the cab.		
*	* *	*	*

Issued on September 4, 1985

Dianne K. Steed
Administrator

50 FR 36995
September 11, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLES SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment; Corrections
[Docket No. 81-11; Notice 14]

ACTION: Final rule; corrections.

SUMMARY: This notice corrects three errors in the amendment published on May 22, 1985, relating to lamps, reflective devices and associated equipment. The errors appear in the amendments to paragraph S4.1.1.36, paragraph S4.1.1.36(e)(4)(ii), and paragraph S6.7.1(a). It is therefore necessary to correct the errors.

SUPPLEMENTARY INFORMATION: On May 22, 1985, Motor Vehicle Safety Standard No. 108 was amended to allow motor vehicles other than motorcycles to be equipped with replaceable bulb headlamp systems consisting of either four lamps with single standardized replaceable light sources, or two lamps each with two such light sources. (50 FR 21052) The Notice consisted of 20 amendments and contained several errors. This notice refers to the numbers of the amendments containing the errors, and corrects them.

In amendment 3, paragraph S4.1.1.36 was amended to delete the word "two." That word, however, appears in two places in the paragraph and it was NHTSA's intent to delete it only with reference to permissible headlighting systems on four-wheeled motor vehicles, and not to delete it for motorcycles. In reviewing this error, NHTSA has concluded that the paragraph should be rewritten to more clearly state NHTSA's intent, and thus is correcting the error by revising this paragraph in a manner which does so.

In amendment 9, as published, the last sentence of paragraph S4.1.1.36(e)(4)(ii) reads: "The lens of each such headlamps shall be permanently marked with the letter 'U.'" A corrective amendment is made to delete a superfluous "such."

In amendment 13, the title of paragraph S6.7.1(a) appeared as "Test for a headlamp with on standardized replaceable light source." "On" should be "one."

1. Paragraph S4.1.1.36 is revised to read:

"S4.1.1.36 Instead of being equipped with a headlighting system specified in Table I or Table III, a motor vehicle manufacturer on or after July 1, 1983, may be equipped with a system of one or two replaceable bulb headlamps, if the vehicle is a motorcycle, or two or four replaceable bulb headlamps, if the vehicle is a passenger car, multipurpose passenger vehicle, truck or bus. Each replaceable bulb headlamp shall be designed to conform to the following requirements."

2. On page 21056, the last sentence of subparagraph (e)(4)(ii) of paragraph S4.1.1.36 is revised to read: "The lens of each such headlamp shall be permanently marked with the letter 'U.'"

3. On page 21057, the title of subparagraph (a) of paragraph,S6.7.1 is revised to read "(a) *Test for a headlamp with one standarized replaceable light source.*"

Issued on September 10, 1985

Barry Felrice
Associate Administrator
for Ruleing King

50 FR 37857
September 18, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices and Associated Equipment

(Docket No. 84-4; Notice 4)

ACTION: Final Rule—Modifications to Type F Headlamp Systems: Optional Compliance.

SUMMARY: This notice amends Safety Standard No. 108 to allow a manufacturer to provide an enhanced upper beam in Type F headlamp systems by wiring the lower beam headlamp to be activated simultaneously with the upper beam headlamp.

Type F headlamps feature identical aiming and seating planes, with the intention that re-aiming will not be necessary when a correctly aimed Type F headlamp is replaced with another Type F. The standard is also amended to provide that each half of the system may be aimed simultaneously if the manufacturer chooses (aiming the lower beam headlamp would automatically re-aim the upper beam lamp), but in order to permit this option, the re-aim tolerance of 1/4 degree for photometric performance compliance will not be permitted for the upper beam headlamp in the Type F system.

This rule is based upon comments to a notice of proposed rulemaking published on May 13, 1985. The agency also proposed, but is not adopting the proposal that Type F lamps be permitted to have an auxiliary filament in the lower beam lamp to be used for purposes other than upper or lower beam performance.

EFFECTIVE DATE: April 18, 1986

SUPPLEMENTARY INFORMATION: When Standard No. 108 was amended to adopt the small four-lamp rectangular headlamp system known as Type F (49 FR 50176), three aspects of the original proposal (49 FR 18321) were reserved for further discussion. These were the use of the lower beam headlamps (Type LF) when the upper beam lamps (Type UF) were activated, simultaneous aim of pairs of headlamps on each side of the vehicle, and the desirability of an optional auxiliary filament in the lower beam lamp. NHTSA had decided that further comment on these issues was desirable before a decision could be made about incorporating them into the Type F system, and issued a second proposal on May 13, 1985 (50 FR 19986). This notice discusses the second proposal and NHTSA's decisions with respect to modifications in the Type F system.

Simultaneous Use of Upper and Lower Beam Headlamps

NHTSA finds merit in the concept of having additional light available during upper beam operation to increase roadway illumination. Such light is readily available from the lower beam filament in the LF lamp. However, since Type F's upper beam (Type UF) lamp alone can meet current upper beam photometric requirements and already exceeds current minimum requirements, there is little or no basis upon which to mandate even more light by requiring the simultaneous use of both beams during upper beam selection, and NHTSA therefore proposed that this method of wiring the headlamps be at the option of the vehicle manufacturer. However, in order to reduce the possibility of excessive foreground light and glare resulting from simultaneous use, NHTSA proposed two new lower beam test points in Type LF lamps, and maximum photometric values for them, 7,000 cd at test point 4D-V (Down-Vertical), and 5,000 cd at the H-V (Horizontal-Vertical) axis. NHTSA tentatively concluded that adopting these new maximum values at 4D-V and H-V would allow safe simultaneous use of the lower and upper beam headlamps during upper beam operation.

Commenters supported the proposal as specified. The California Highway Patrol (CHP) expressed reservations about removing the option from the driver's control though convinced of the occasional utility of a supplement to the upper beam.

NHTSA does not agree with the CHP on this issue. While a driver might be in the best position to decide whether to use additional illumination, as NHTSA has stated before, it believes that additional specifications would be needed to ensure fail-safe switching from the upper beam or upper/lower beam to the lower beam alone, and that an additional warning telltale might be required as well. NHTSA does not believe that the benefits of allowing this choice to the driver would outweigh the costs, and the final rule adopts simultaneous use as a wiring option for the manufacturer rather than an operational option for the driver.

Simultaneous Aim (Co-Aiming) of Headlamps

General Motors, the developer of the Type F system, recommended a method to aim simultaneously both the upper and lower beam headlamps. Both lamps would be mounted in a common housing and have a common aim adjustment to permit such "co-aiming". It would be possible to co-aim both lamps as long as the combination of the two lamps in the common co-aiming assembly could meet the overall photometric requirements. The agency proposed that Type F lamps could be mounted on common and parallel seating and aiming planes provided that: (a) when tested in accordance with the provisions of Standard No. 108, the assembly is designed to conform to the test point values of the revised Figure 15 and (b) there shall be no provision for adjustment between the common or parallel aiming and seating planes of the two lamps. The agency also proposed to remove the ± ¼ degree re-aim tolerance for the UF headlamp and to permit that tolerance to be allowed for the co-aiming assembly.

Ten of the 11 commenters to the docket concurred, the eleventh, Insurance Institute for Highway Safety, offering no comment on the point. Many of the comments asked for clarification of the language in the test procedure for co-aiming. The agency has clarified the test procedure by providing that the assembly shall be located on a goniometer placed at least 60 feet from the photometer. The LF lamp is aimed mechanically by centering the unit on the photometer axis and aligning its aiming plane to be perpendicular to the photometer axis. The assembly is then moved in a plane parallel to the established aiming plane of the LF unit until the UF lamp is centered on the photometer axis. The photometry measurement of the UF lamp is completed by using the aiming plane thus established, and allowing a ± ¼ degree re-aim tolerance for meeting the test points as measured in the co-aimed assembly.

To provide consistency in the aiming requirements, it was also proposed that testing of the individual lamps could not include a ± ¼ degree re-aim tolerance for the UF lamp alone. Therefore, paragraph S4.1.1.43(b) and Figure 15 have been revised to accomplish this. Heretofore, such allowances were placed in Figure 15, however for regulatory consistency, such allowances and restrictions should be placed in the text as other requirements are. Paragraph S4.1.1.43(b) now includes such requirements and Figure 15 does not. This arrangement of photometric and construction specifications assures that the entire assembly will be properly aimed in service if a mechanical aimer is used to aim the LF lamp in co-aimed assembly. However, if optical aiming is used or if a mechanical aimer is used in conjunction with the UF lamp of the assembly, the in-service aim of the assembly may be in error. As a partial remedy to the possibility of using a mechanical aimer in conjunction with the UF lamp, a safeguard was originally proposed in the first NPRM for the Type F headlamp system. This proposal would have required manufacturers to provide a means of preventing use of the mechanical aimer on the UF lamp of the co-aimed assembly. However, the proposal was not included in the second NPRM because NHTSA tentatively concluded that without similar provision to prevent optical or visual aiming, only a portion of the problem would be addressed. Labelling could be provided as a guide to reduce the likelihood of optical aim, but the likelihood of success is unknown.

There is also the question of whether or not the possibility of use of inappropriate aiming procedures in service is likely to have a significant safety impact. NHTSA believes that the likelihood of there being a significant safety impact is low. Because properly aimed Type F headlamps may be replaced without re-aim, and because the co-aim assembly will have only two aiming screws, NHTSA believes that these assemblies will usually be treated as a two beam headlamp is treated in that the lower beam is used for aiming purposes. Consequently, NHTSA will allow the optional use of co-aiming, using the clarified procedure above, but will not require the prevention of aim of the upper beam lamp.

Optional Auxiliary Filament in the Lower Beam Lamp

Incorporation of an optional auxiliary filament in the Type F system was a feature of the original GM design, which was subsequently deleted by the developer. In the original rulemaking, NHTSA determined that there were no safety reasons to mandate or permit its use. However, because Chrysler Corporation strongly recommended the incorporation of the auxiliary filament for safety purposes other than upper beam or lower beam use, the agency again proposed its optional inclusion. Specifically, Chrysler would use the auxiliary filament to increase conspicuity of the vehicle during daytime operation.

Five commenters opposed the proposal while three were in favor of it and one, the California Highway Patrol, was neutral. Of the three, Chrysler suggested that it could be used to provide a daytime running light. North American Phillips saw no reason to oppose it. American Motors commented that manufacturers should have the design flexibility to use such a filament. GM offered arguments against the auxiliary filament similarly to those previously offered, stating that the auxiliary filament would reduce lamp life and reliability, reduce bulb reliability, cause a filament shadow during lower beam use, and increase cost. Commenters recommended against it on the basis that it was premature to permit such a feature which could adversely affect headlamp performance when the need and specifications for daytime running lights remain to be determined. Additionally, because the auxiliary filament would be unregulated in both design and performance, manufacturers could choose to use the filament for other functions where optics must be controlled, such as for use as driving or fog lamps, with the possibility of a resulting optical prescription for the lens that would be in conflict with that necessary for a headlamp. The inappropriate prescription would thereby compromise lower beam performance. Should lamps with auxiliary filaments be produced, the headlamps would be physically interchangeable, but would not be functionally interchangeable. In addition this would result in proliferation without accompanying advantages for the public. Accordingly, NHTSA has not adopted the proposal to allow a third type of Type F headlamp, one incorporating an auxiliary filament.

Standardization of SAE References

Under Standard No. 108, Type F headlamps and those incorporating standardized replaceable light sources are designed to meet the requirements of SAE J579c, December 1978, but original equipment sealed beam headlamps must conform to SAE J579c, December 1974. For regulatory clarity, NHTSA proposed that the December 1978 version be the sole version incorporated by reference. Similarly it proposed that a standardized reference to SAE J580 be adopted. The changes between the earlier and later versions of the two SAE standards were discussed in detail in the notice of proposed rulemaking and their effect deemed non-substantive. These changes have been adopted, there being no negative comments submitted.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 108, *Lamps Reflective Devices, and Associated Equipment,* is amended as follows:

The authority citation for Part 571 is revised to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

1. Subparagraph (b) of paragraph S4.1.1.43 is revised to read:

(b) The photometric requirements of Figure 15. A re-aim tolerance of ± ¼ degree is allowed for any test point on the Type LF lamp when tested alone, and such a tolerance is not allowed for the type UF lamp when tested alone. For the test point 10U-90U, measurement shall be from the normally exposed surface of the lens face.

2. A new paragraph S4.1.1.46 is added to read:

* * * * *

S4.1.1.46 Type F headlamps may be mounted on common or parallel seating and aiming planes to permit simultaneous aiming of both headlamps provided that or when tested with any conforming Type UF and LF headlamps according to paragraph S8, (a) the assembly (consisting of the Type UF and LF headlamps, mounting rings, the aiming/seating rings, and aim adjustment mechanism), shall be designed to conform to the test point values of Figure 15. (b) There shall be no provision for adjustment between the common or parallel aiming and seating planes of the two lamps.

3. A new paragraph S4.5.12 is added to read:

* * * * *

S4.5.12 On a motor vehicle equipped with a Type F headlighting system, the lower beam headlamps (Type LF) may be wired to remain permanently activated when the upper beam headlamps (Type UF) are activated.

* * * * *

4. A new paragraph S8 is added to read:

S8 Photometry Test for Simultaneous Aim, Type F Headlamps. The assembly shall be located on a goniometer placed not less than 60 feet (18.3 m) from the photometer. The LF unit shall be aimed mechanically by centering the unit on the photometer axis and aligning the aiming plane of the lens perpendicular to the photometer axis. Then the assembly shall be moved in a plane parallel to the established aiming plane of the LF headlamp until the UF headlamp is centered on the photometer axis. Photometry measurements of the UF photometry unit shall be completed using the aiming plane so established. A re-aim tolerance of ±¼ degree is allowed for any test point.

5. Figure 15 is revised as follows:

FIGURE 15

Photometric Test Point Values

Upper Beam			*Lower Beam*		
Test Points deg	*cd. max.*	*cd. min.*	*Test Points deg*	*cd. max.*	*cd. min.*
2U-V	—	1,500	10U-90U	125	—
1U-3R and 3L	—	5,000	1U-1-½L to L	700	—
H-V	70,000	40,000	½U-1-½L to L	1,000	—
			½D-1-½L to L	3,000	—
			1-½U-1R to R	1,400	—
H-3R and 3L	—	15,000			
H-6R and 6L	—	5,000	½U-1R to 3R	2,700	—
H-9R and 9L	—	3,000	½D-1-½R	20,000	10,000
H-12R and 12L	—	1,500	1D-6L	—	1,000
			1-½D-2R	—	15,000
1-½D-V	—	5,000	1-½D-9L and 9R	—	1,000
1-½D-9R and 9L	—	2,000	2D-15L and 15R	—	850
2-½D-V	—	2,500	4D-4R	12,500	—
2-½D-12R and 12L	—	1,000			
4D-V	5,000	—	4D-V	7,000	—
			H-V	5,000	—

6. Paragraphs S4.1.1.13(b), S4.1.1.21, S4.1.1.33, S5.1 and Tables I and III (under the right hand column "Applicable SAE standard or recommended practice" parallel to the item "Headlamps") are amended by changing "December 1974" to "December 1978."

7. (a) In Tables I and III the right hand columns "Applicable SAE standard or recommended practice" are amended by adding the wording "(See S5 for subreferenced SAE materials)".

(b) Tables I and III (under the right hand column "Applicable SAE standard or recommended practice" parallel to the item "Headlamps") are amended by changing "J580b February 1974" to "J580 AUG 79".

Issued on March 13, 1986.

Diane K. Steed
Administrator

51 F.R. 9455
March 19, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 17)*

ACTION: Final rule.

SUMMARY: *Changes in Replaceable Light Source Specifications.* This notice amends Safety Standard No. 108 to modify the specifications for the standardized replaceable light source. This will allow a manufacturer to determine the diameter of the glass capsule, while specifying the location of the black cap for assuring the interchangeability of the standardized light source in different lamp designs to achieve the required photometric performance. The amendment relieves certain design restrictions currently in effect, and achieves greater interchangeability for the light source. A notice of proposed rulemaking was published on September 18, 1985.

DATES: The effective date for the amendment to Figure 3-2 is November 3, 1986. The effective date for the remaining amendments is May 7, 1986.

SUPPLEMENTARY INFORMATION: On September 18, 1985, NHTSA proposed certain modifications to the standardized replaceable light source which is specified by Motor Vehicle Safety Standard No. 108 for use in headlamps (50 FR 37882). The purpose of the proposal was to allow a manufacturer more flexibility in specifying the diameter of the glass capsule of the light source, and to revise the method for specifying the location of the black cap.

The proposal incorporated the following elements: a revised "interchangeability drawing" for the headlamp bulb assembly's halogen capsule (Figure 3-5) with certain angles and dimensions different than those presently specified; a revised lumen test necessitated by testing the light source with the black cap in place, requiring amendments to paragraph S4.1.1.38 (the test being currently performed without the black cap); finally, a modification in the allowable tolerances of the light source with a view towards a more accurate orientation of beam pattern, while permitting greater headlamp styling freedom. Here NHTSA proposed tolerances petitioned for by General Motors, and NHTSA's own alternative values.

Comments were received on the proposal from vehicle manufacturers (Chrysler Corporation, American Motors Corporation, SAAB-Scania of North America, Volkswagen of America, General Motors Corporation, Ford Motor Company), lighting equipment manufacturers (Koito Manufacturing Co., GTE/Sylvania, General Electric Company, North American Philips Lighting Corporation), the Department of California Highway Patrol, and the SAE Replaceable Headlamp Bulb Task Force. The proposal was supported, with suggested modifications.

The purpose of the rulemaking with respect to the location of the black cap was to relieve a burden to manufacturers of having to build a light source with a narrowly specified glass cap diameter. To accomplish this, the location of the black cap and that of the undistorted glass must be specified in a manner which would be tolerant of changes in diameter while assuring that photometric performance was maintained. This led to the angular method used in the Notice of Proposed Rulemaking for specifying these locations. The method of dimensioning used the light source base as a reference because this would provide the easiest measurement reference for determining compliance of these parameters, and measurements could be more easily performed using vernier calipers rather than the more difficult optical comparator.

The proposed method of specifying the black cap location assumed that it would be installed on the light source after the capsule was installed on the base, but as commenters pointed out, this is not always the way that a light source is manufactured. Sylvania, for example, first installs the black cap on the capsule, then determines for what application the completed capsule will be used. Thus, the method NHTSA proposed would impose a burden of tolerance stackup which has the potential of creating noncompliances or possible photometric errors if the

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*Inadvertently published in the *Federal Register* as Notice 18.

assembly procedure remained unchanged. Therefore, Sylvania and other commenters recommended using the actual location of the lower beam filament as a reference. NHTSA considers this a reasonable alternative, and in view of the fact that some manufacturers are already producing light sources in this fashion, the agency is amending Figure 3-5 to accommodate this comment.

Commenters also suggested that NHTSA adopt other changes for Figure 3-5 which would help clarify it, namely the revisions put forth by the SAE Replaceable Headlamp Bulb Task Force. These involve deletion of certain dimensions and redrawing of others, and changes in Notes. NHTSA has made appropriate modifications in line with the comments.

The September 1985 notice proposed alternative tolerances for the lower beam filament, one based upon a set of tolerances petitioned for by General Motors, and the other developed by NHTSA. Commenters objected to both alternatives, and recommended the tolerances developed by the SAE Task Force. These tolerances are based upon those that industry believes are consistently achievable with today's state-of-the-art in production machinery and quality assurance equipment. Ford and VW commented that the SAE tolerances would help improve the maintenance of beam pattern after bulb replacement. Tighter filament tolerances will also permit greater freedom in headlamp styling and manufacture. Judging by the comments received on the notice, there is little support for retaining the existing tolerances, and little support for either the GM or NHTSA alternative tolerances that were proposed. The SAE tolerances lie between the current ones and those proposed; since this represents a consensus among those who chose to comment, NHTSA has adopted it, and is amending the dimensions in Figure 3-2 appropriately. The new tolerances for the lower beam ahead/behind are plus or minus 0.010 inch, and plus or minus 0.015 inch for up/down and left/right. For the upper beam, the tolerance is 0.025 inch for ahead/behind and up/down and 0.032 inch for left/right.

Comments about lumen values generally accorded with the proposal, to test with the black cap on, rather than without. SAAB argued that the values were too low while the California Highway Patrol thought that there was a large disparity in making the conversion from values without a black cap to those with a cap. NHTSA believes that a number of factors must be considered when making such a conversion. The black cap blocks off light to the front of the capsule and causes a drop in light output, but the filament still emits the same amount of light as it did without the cap. The location of the cap may vary plus or minus 1 mm. Filament variances plus cap location will cause a greater variation of light output from a capped bulb, than one that has no cap, where only the filament variances affect light output. These two factors cause a drop in measured light output from capped bulbs and cause the tolerance to increase. However, the light source is still the same one that had previously been tested without the black cap, and is still designed to conform to the other requirements so that the headlamp will perform in accordance with the requirements of the standard, and thus the lumen values have been adopted as proposed.

Koito requested that a more detailed specification be provided for the "opaque white colored cover" that is to be used in the lumen test (S4.1.1.38(b)(7)). The agency has added this clarification to the language otherwise proposed and adopted: "This cover shall be used to eliminate the likelihood of incorrect lumen measurement that would occur should the reflectance of the light source base and electrical connector be low."

The agency had proposed that the amendments be effective upon publication of the final rule in the *Federal Register.* Ford commented that this would be impracticable in that it would not allow enough time for both vehicle and light source manufacturers to prepare for building complying hardware, and it asked for lead time of one year. No other vehicle or light source manufacturer requested such an extension, and the agency has concluded that no need has been shown for a delay of the nature Ford requested. Therefore, amendments that reduce an industry burden (those pertaining to capsule diameter, black cap placement, and revised lumen values) are made effective on the publication date of the final rule, as proposed. However, the amendment that places tighter tolerances on the filaments, and thus which has the potential of increasing an industry burden, will become effective six months following the publication of the rule.

Except for the amendment to Figure 3-2, the amendments are effective upon publication of the final rule in the *Federal Register.* Because the rule would relieve a restriction and create no additional burden, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance of the final rule is in the public interest. The amendment to Figure 3-2 is effective November 3, 1986.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. While the rule does impose minor additional requirements and costs, it also permits manufacturers greater flexibility in the styling and design of headlighting systems.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

1. The authority citation for Part 571 continues to read as follows:

AUTHORITY: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§571.108 [Amended]

2. The first sentence of paragraph (b) of paragraph S4.1.1.38 is revised to read:

(b) The standardized replaceable light source shall meet the requirements in paragraphs (b)(1) through (b)(7) of this section.

3. In paragraph (b)(1) of paragraph S4.1.1.38 the tabular portion of the general specifications is amended as follows:

	Lower beam	Upper beam
* * * * *		
Lumens (with black cap at 12.8V design voltage)	700+/−15%	1200+/−15%
* * * * *		

4. A new paragraph (b)(7) is added to paragraph S4.1.1.38 to read:

(b)(7) Lumens shall be measured in accordance with the Illuminating Society of North America, LM-45: IES Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filaments Lamps (April 1980), and with that electrical connector and light source base (except for the portion normally located within the interior of a lamp housing) shrouded with an opaque white colored cover. This cover shall be used to eliminate the likelihood of incorrect lumen measurement that would occur should the reflectance of the light source base and electrical connector be low.

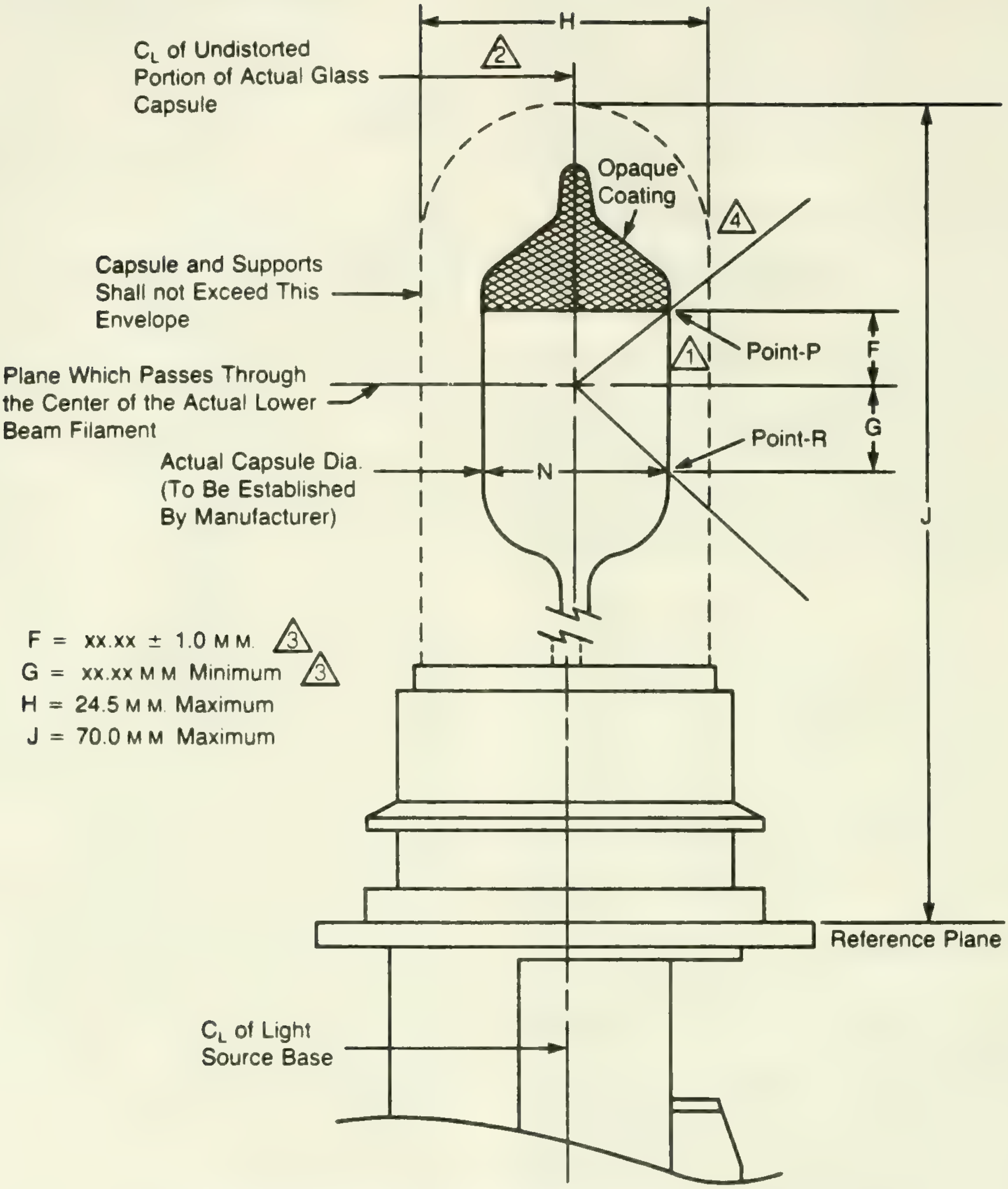
5. Figure 3-2 is revised as follows:

FIGURE 3-2
INTERCHANGEABILITY DRAWING HEADLAMP BULB ASSEMBLY

[Dimensional specifications for Figure 3-1]

DIMENSION	INCHES	MILLIMETERS
A	(0.085 to 0.083) 0.002 either side CL	(2.15 to 2.10) 0.05 either side CL
F	0.906	23.00
H	0.079	2.00
K: Lower beam	1.752+/−0.010	44.50+/−0.25
Upper beam	CL to be within +/−0.025 of CL of lower beam	CL to be within +/−0.64 of CL of lower beam
M	0.974	24.75
N	(1.335 to 1.331) 0.002 either side CL	(33.90) to (33.80) 0.05 either side CL
O	0.517+/−0.020	13.13+/−0.50
P	1.673	42.50
R	(1.126 to 1.122) 0.002 either side CL	(28.60 to 28.50) 0.05 either side CL
U	1.181	30.00
V	0.413	10.50
W	0.128	3.25
X	0.189	4.80
AC	0.045+/−0.015	1.15+/−0.38
AD	0.091+/−0.025	2.30+/−0.64
AE	0.047+/−0.015	1.20+/−0.38
AF	0.094+/−0.032	2.40+/−0.81
AH	0.356	9.05
AM	0.415	10.54
AN	0.673	17.10

6. Figure 3-5 is revised as follows:


H
△2
C_L of Undistorted Portion of Actual Glass Capsule
Opaque Coating
△4
Capsule and Supports Shall not Exceed This Envelope
Point-P
△1
F
Plane Which Passes Through the Center of the Actual Lower Beam Filament
G
Point-R
Actual Capsule Dia. (To Be Established By Manufacturer)
N
J
F = xx.xx ± 1.0 M M. △3
G = xx.xx M M Minimum △3
H = 24.5 M M. Maximum
J = 70.0 M M Maximum
Reference Plane
C_L of Light Source Base

△1 Glass Capsule Periphery Shall be Optically Distortion Free Between the Planes Perpendicular to the Centerline at Points P and R.

△2 Diameter "H" Shall be Concentric with the Centerline of the Light Source Base.

△3 Exact Values of F and G Shall be Determined by Using the Following:
F = (N/2) Tan 38
G = (N/2) Tan 43

△4 Entire Radius and Distorted Glass Shall be Covered to the Plane Passing Through Point "P", Perpendicular to the Glass Capsule Centerline.

Figure 3-5. Halogen Capsule

7. Figure 3-6 is deleted.

Issued on April 29, 1986

Diane K. Steed

Diane K. Steed
Administrator

51 F.R. 16847
May 7, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 18)*

ACTION: Final rule.

SUMMARY: This notice adopts two new types of standardized replaceable light sources to be used in replaceable bulb headlighting systems on motor vehicles. In a two light source system developed by General Motors Corporation ("GM") one source provides the upper beam, and the other, the lower beam. The new light sources will be known as "HB3" and "HB4". The present standardized replaceable light source is now designated "HB1".

The rule is based upon a notice published January 7, 1986, that proposed dimensional changes differing from those originally proposed on May 13, 1985.

EFFECTIVE DATE: June 2, 1986.

SUPPLEMENTARY INFORMATION: On May 13, 1985, NHTSA published a proposal to allow new types of standardized replaceable light sources in motor vehicle headlamps (50 FR 19961). Two of these light sources were designed by GM, one intended to provide the upper beam, which would be denominated HB3, and the other to provide the lower beam, to be denominated HB4. After the close of the comment period, GM submitted new drawings and specifications for the light sources which it felt met the needs of the industry as a result of its efforts with the SAE Replaceable Bulb Task Force. Later it submitted further updates of specifications.

Accordingly, on January 7, 1986, NHTSA published a second NPRM on this subject, proposing a revision in dimensional specifications (Figures 19 and 20) incorporating the GM changes, which included the provision for a seal (51 FR 641). NHTSA is now amending Standard No. 108 to add the HB3 and HB4 light sources in accordance with the previous proposals.

In the May 1985 notice, NHTSA proposed that the light sources meet the photometric requirements of Type F sealed beam headlighting systems. With reference to the internal heat tests of S6.7, no flash rate is currently specified for a turn signal that is incorporated into a headlamp housing. NHTSA, believing that there could be excessive buildup of heat from a steady burning signal, proposed to include a flashing turn signal at the test condition of 90 flashes per minute with a 75 plus or minus 2% current "on-time" performance. Because HB3 and HB4 have filament locations different from that of the current standardized replaceable light source (to be known from now on as "HB1"), NHTSA proposed changing the bulb deflection test to accommodate these differences. The point of deflection would be at a specific measured distance from a reference plane instead of being located by reference to the filament. This change was also proposed for the HB1 with the actual deflection point remaining the same. Additionally, for HB3 and HB4, the direction of force application was specified to be radially inward anywhere in the perpendicular plane located at the application point.

In its proposal, NHTSA also sought comment on whether there were any safety reasons, such as excessive glare, excessive candela, or insufficient illumination to prohibit intermixes of the HB1 with HB3 and HB4 and conversely to seek appropriate photometric and other specifications which would be required to permit such intermix, should commenters deem that course of action desirable.

The proposals in the second notice published in January 1986 were confined to dimensional changes, and the addition of a protective seal for HB3 and HB4 meeting the performance criteria proposed.

Comments were received on both proposals from major vehicle and lighting equipment manufacturers. With regard to the photometry of HB3 and HB4, Chrysler Corporation and Ford Motor Company urged that only one photometric performance requirement be implemented for all headlamp systems. Because three performance requirements currently exist; Type F, SAE J579a, and SAE J579c, this suggestion cannot be implemented at this time. Accordingly, NHTSA has proceeded to adopt the Type F photometrics for the HB3 and HB4, a proposal that was supported by Sylvania GTE, Department of California Highway Patrol, and GM among others. Further, the comments generally supported intermixing of

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*Inadvertently published in the *Federal Register* as Notice 17.

light sources, given that headlamp systems are all required to meet minimum photometric requirements, and that NHTSA has proposed labeling of the headlamp lens to denote the type of light source used. Ford commented that intermixing will permit designers to optimize lighting for glare and seeing distance. On the other hand, GTE Sylvania and General Electric were opposed to intermixing until further study of the likely effects can be completed. Sylvania suggested that the SAE Lighting Committee should resolve the questions of intermixing and the related simplification of photometrics to achieve a single performance level. NHTSA believes that as long as photometric performance is met, and the lens identifies the light source, there is no reason to prohibit intermixing, and is amending the standard to allow it provided that the system meets Type F photometrics.

The proposed bulb deflection test specified that the direction of the application of force be radially inward anywhere in the perpendicular plane located at the application point. All those who commented recommended a revised procedure that would exercise the deflection resistance performance while simplifying the test. The basis for the recommendations is the SAE Replaceable Headlamp Bulb Task Force work on SAE XJ1496, Recommended Practice for Headlamp Light Sources. This states essentially that the deflection force should be applied radially at four equally spaced intervals at the light center length of the lower beam filament (or upper if there is only an upper beam filament), beginning at the weakest axis of the bulb crimp. NHTSA agrees with this recommendation because it is a simpler method of achieving the same goal, and the standard is amended accordingly. Comments also supported the proposed test conditions for turn signals in replaceable bulb headlamps (amended in Item 4, 50 FR 21056) and the standard has been amended accordingly.

Regarding the specification changes proposed in January 1986, all comments except those received from Hella and Sylvania supported the proposal. Hella requested ECE tolerances, but would accept the recommendation by the SAE Bulb Task Force. Sylvania in essence requested a capsule and support envelope with a diameter of at least 19.68 mm for the HB3, because of limitations of its manufacturing equipment, and NHTSA is making this change to accommodate this concern. However, it necessitates the addition of a note requiring the capsule and supports to provide for insertion into the lamp without interfering with the lamp's key. The numbers suggested by the SAE Headlamp Bulb Task Force have been added to Figure 20. The larger diameters could create a burden for headlamp manufacturers but not light source manufacturers such as Sylvania because space will be removed that was previously reserved for internal lamp parts; however, the agency knows of no instance in which lamp design has been so far finalized that this would occur. The NPRM of May 1985 contained a note to the Figures: "Bulb envelope must not exceed this area". This was changed to "Bulb envelope must not exceed this volume" in the January 1986 NPRM. To achieve consistency in the standard and to more clearly state the note, NHTSA is adopting the language used in a similar note for the HB1 light source: "Capsule and supports shall not exceed this envelope."

The commenters discussed other issues of interest as well. Both the Federal Highway Administration (FHWA) and Volkswagen addressed the need to assure adequate illumination of overhead signs, and other highway indicators. The FHWA suggested that new minimum test point values be added to the photometric performance requirements for all headlamps. While this is beyond the scope of the present rulemaking, it will remain under consideration.

Hella recommended that a "standardized bulb" rather than "any" bulb be used for compliance testing, specifically the bulb set forth in the SAE XJ1496 document. NHTSA continues to believe that any light source which is available to the consumer in the market place should be used for compliance testing, rather than one specially prepared for laboratory use.

Some commenters felt that industry terms, such as "9004", should be used to designate light sources rather than NHTSA's terminology, such as "HB1". Other commenters felt that the terminology should be applied in a sequence different from that proposed, such as the 9005 being HB5 and 9006 being HB6. The agency does not deem either of these suggestions desirable. In the first case, should a light source meeting HB1 specifications be developed that uses less power to achieve the same performance, the HB1 nomenclature would allow it to be used in any headlamp designed to use the original light source. But the updated replacement would probably have some other trade number, 9008 for example, to indicate its lower power consumption. This difference in trade numbers could be confusing to consumers seeking to replace the light source. Therefore, NHTSA intends to continue Standard No. 108's nomenclature for headlighting systems. Industry, of course, is free to assign any trade numbers it wishes, but is required to certify that the light source is designed to conform to the requirements of Standard No. 108. The same logic has been applied to replaceable headlamp light sources. In the second case, on the application of the NHTSA terminology, NHTSA proposed the HB number sequence based on the order in which light sources were received for incorporation into the Standard. Additionally, because the European H-4 light source could be different from the proposed U.S. version of that light source and not have the same uses in the U.S. market as it has traditionally had, a distinctly different nomenclature is deemed necessary. Therefore, NHTSA is implementing the nomenclature as proposed for the HB1, HB3 and HB4.

With respect to "designed to conform", some commenters noted that the language proposed for S4.1.1.39 contemplated light sources that "conform" as contrasted with the requirement in S4.1.1.36 that headlamps other than sealed beam be equipped with light sources "designed to conform". To remove this inconsistency with paragraph S4.1.1.36, NHTSA has adopted the "design to conform" language in S4.1.1.39.

The comments reflected a wide range of opinion about the need for labelling of headlamp lenses with information such as light source type, beam type, and photometric performance designation. Lamp manufacturers are concerned about the adverse effects on headlamp performance, especially if the location of the labelling is a specified one. NHTSA has concluded that motor vehicle safety requires identification of the light source, and the proper function of a headlamp (upper or lower beam) when two headlamp types are used on a vehicle. It is not necessary to provide photometric performance information when the lens identifies the light source. Replacement of a light source with one of the same type will assure equivalent and compatible lighting performance. However, there is no compelling reason to specify that any information be located at the lens center. NHTSA has decided to leave placement of the information to the discretion of the manufacturer, as long as the information is placed on the lens area in front of, and used by the light source it is designating.

ETL Testing Laboratories asked for three clarifications of the proposal. The language in proposed S4.1.1.39(f) and (h) regarding "low pressure side" was unclear. The "low pressure side" is the connector side of the HB3 or HB4 light source base. This test of the sealing mechanism does not apply to the HB1. The second point of confusion was the extent of the photometry test of S6.7.2. Except for a headlamp with a single HB1 light source, the photometry test is intended to be a complete testing of all test points for the beam or beams produced by the lamp. Finally, in S6.7.2, a statement was requested on the conditions of time lapse or temperature stabilization occurring after the high temperature test and before the photometry test. NHTSA replies that there should be sufficient time for the temperature of the lamp to stabilize to room ambient temperature.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order No. 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. However, a regulatory evaluation has been prepared and placed in the public docket. Since use of the two light sources is optional, the rule would not impose additional costs or requirements but would permit manufacturers greater flexibility in the use of headlighting systems.

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. The rule may have a small positive effect on the human environment since the weight and quantity of materials used in the manufacture of headlamps would be reduced.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule will not have a significant economic impact on a substantial number of small entities. Accordingly, no regulatory flexibility analysis has been prepared. Manufacturers of motor vehicles and headlamps, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Finally, small organizations and governmental jurisdictions would not be significantly affected since the price of new vehicles, headlamps, and aimer adjusters will be minimally impacted.

Because of the necessity for vehicle, headlamp, and replaceable light source manufacturers to plan production and distribution on an orderly basis, it is hereby found that an effective date earlier than 180 days after issuance of the final rule is in the public interest.

The engineer and lawyer primarily responsible for this rule are Richard Van Iderstine and Taylor Vinson, respectively.

List of Subjects in 49 CFR Part 571

Imports, Motor vehicle safety, Motor vehicles, Rubber and rubber products, Tires.

Part 571 - [AMENDED]

In consideration of the foregoing, 49 CFR Part 571 and 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

The authority citation for Part 571 continues to read as follows:

Authority: 15 U.S.C. 1392, 1401, 1403, 1407; delegation of authority at 49 CFR 1.50.

§571.108 [Amended]

1. The definition of "Standardized replaceable light source" in S3 *Definitions* is revised to read:

"Standardized replaceable light source" means an assembly of a capsule, base, and terminals that meets the requirements of S4.1.1.39.

2. In paragraph S4.1.1.36, paragraph (a)(1) is revised to read:

(a)(1) Each replaceable bulb headlamp shall include components which are designed to conform to the applicable specifications of paragraphs S4.1.1.37, S4.1.1.38 and S4.1.1.39.

3. The first sentence of Paragraph (b)(2) of S4.1.1.36 is revised to read:

(2) Section 3.1 – Test Voltage and Section 3.5 – Photometric Design Requirements, excluding Tables 1 and 2 for headlamps equipped with Type HB3, Type HB4, Types HB1 and HB3, or Types HB1 and HB4, and excluding Table 2 of SAE J579c *Sealed Beam Headlamp Units for Motor Vehicles* December 1978 for headlamps in systems with only Type HB1.

4. In Paragraphs (d)(1), (d)(3), (d)(5), (d)(6)(A), (d)(6)(B), and (d)(7) of paragraph S4.1.1.36, the words "of SAE J579c *Sealed Beam Headlamp Units for Motor Vehicles*, December 1978" are removed and the words "applicable to the headlamp system under test" substituted.

5. A new paragraph (e) is added to S4.1.1.36, before (e)(1) to read: "For a headlamp equipped with one or two Type HB1 light sources the following requirements apply."

6. A new paragraph (f) is added to S4.1.1.36 to read:

"For headlamp systems equipped with Type HB3 and HB4, HB1 and HB3, or HB1 and HB4 light sources, the following requirements apply:"

(1) There shall be no mechanism that allows adjustment of an individual light source, or adjustment of reflector aim on a headlamp with two light sources.

(2) Lower beam photometrics shall be provided by filaments with a minimum average design life of not less than 320 hours.

(3) The lower and upper beams of a headlamp system consisting of two lamps, each containing two light sources (type HB3 and HB4, or type HB1 with HB3 or HB4) shall be provided only as follows:

(i) The lower beam shall be produced in one of the following ways:

(A) By the outboard light source (or the uppermost if arranged vertically) or single light source, designed to conform to the lower beam requirements of Figure 17; or,

(B) By both light sources, designed to conform to the lower beam requirements of Figure 17.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) or single light source, designed to conform to the upper beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the upper beam requirements of Figure 17.

(4) The lower and upper beams of a headlamp system consisting of four lamps, using HB3 and HB4, HB1 and HB3, or HB1 and HB4 light sources, each containing only a single light source, shall be provided only as follows:

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "L".

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "U".

(5) For replaceable bulb headlamps, a +/−¼ degree reaim tolerance is permitted for the test points of Figures 15 and 17. The test point 10U-90U shall be measured from the normally exposed surface of the lens face.

7. Paragraph S4.1.1.37 is revised to read:

S4.1.1.37 Each lens-reflector unit manufactured as replacement equipment for a replaceable bulb headlamp system shall be designed to conform to the requirement of S4.1.1.36 when any standardized replaceable light source appropriate for such unit is inserted in it.

8. Section 4.1.1.39 is removed. S4.1.1.40 is redesignated S4.1.1.38 and revised as follows.

S4.1.1.38 The lens of each replaceable bulb headlamp and the base of each standardized replaceable light source shall be marked as follows:

(a) With the symbol "DOT" horizontally or vertically which shall constitute certification that the headlamp or light source conforms to all applicable Federal motor vehicle safety standards.

(b) The base of each Type HB3 and HB4 light source shall also be marked by its manufacturer or importer with its HB Type Designation and the name or trademark registered with the U.S. Patent Office of the manufacturer and importer (if applicable).

(c) The lens of each replaceable bulb headlamp using HB3 or HB4 light sources, or HB1 light sources in conjunction with HB3 or HB4 light sources within a headlamp system on a motor vehicle shall permanently display the Type Designation(s) for that standardized replaceable light source on the lens in front of each light source.

9. Paragraph S4.1.1.38 is redesignated S4.1.1.39 and revised as follows:

S4.1.1.39 Each standardized replaceable light source shall be designed to conform to the following requirements:

(a) A type HB1 light source shall be designed to conform to the dimensions specified in Figure 3 and shall incorporate a silicone O-ring. A Type HB3 light source shall be designed to conform to the dimensions specified in Figure 19. A Type HB4 light source shall be designed to conform to the dimensions specified in Figure 20.

(b) Each standardized replaceable light source shall be designed to conform to the following general specifications:

Specification	Lower Beam	Upper Beam
Maximum power, watts		
HB1	50	70
HB3	----	70
HB4	60	----
Luminous flux, lumens:		
HB1	700±15%	1200+15%
HB3	----	1700±12%
HB4	1,000±15%	----
Minimum average design life, hours: all	320	150

(c) The standardized replaceable light source filament(s) shall be subject to seasoning before measurement of maximum power and luminous flux.

(d) Measurement of maximum power and luminous flux shall be made with the direct current test voltage regulated within one quarter of one percent. The test voltage shall be design voltage, 12.8v. The measurement of luminous flux for the HB1 shall be in accordance with the Illuminating Society of North America, LM-45: *IES Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps* (April 1980), shall be made with the black cap installed on HB1 and HB4, and shall be made with the electrical connector and light source base shrouded with an opaque white colored cover, except for the portion normally located within the interior of the lamp housing. The measurement of luminous flux for the HB3 and HB4 shall be with the base covered with a white cover shown in Figures 19-1 and 20-1. The white covers are used to eliminate the likelihood of incorrect lumen measurement that will occur should the reflectance of the light source base and electrical connector be low.

(e) Measurement of minimum average design life shall be made at 14.0v for all light sources. Testing is conducted in a completed headlamp assembly, or equivalent, placed in the attitude in which the assembly is to be installed on a motor vehicle.

(f) The capsule, lead wires and/or terminals on each Type HB1, Type HB3 and Type HB4 light source shall be installed in the base so as to provide an airtight seal. Such a seal exists on Type HB3 and Type HB4 when no air bubbles shall appear on the low pressure (connector) side after the light source has been immersed in water for one minute while inserted in a cylindrical aperture of 0.796 ± 0.004 in. (20.22 ± 0.10 mm) (Type HB3) or 0.875 ± 0.004 in. (22.22 ± 0.1 mm) (Type HB4) and subjected to a minimum air pressure of 69kPa (10 P.S.I.G.) on the glass capsule side.

(g) After the force deflection test conducted in accordance with S7, the permanent deflection of the glass envelope shall not exceed 0.005 in. (0.13 mm) in the direction of the applied force.

(h) A general tolerance shall apply to Figure 3 as follows: +/−0.004 in. (0.10 mm) to all linear dimensions and +/−1°0′ to all angular dimensions except for referenced dimensions and unless otherwise specified.

10. Paragraph S4.5.8 is amended by adding the following as a second sentence:

S4.5.8***On a motor vehicle equipped with a headlighting system comprising four replaceable bulb headlamps designed to conform to the photometry of Figure 15, the lamps marked "L" may be wired to remain permanently activated when the lamps marked "U" are activated.

11. Paragraph S4.5.9 is revised to read:

S4.5.9 The wiring harness or connector assembly of a replaceable bulb headlamp with two identical standardized replaceable light sources or a four-lamp replaceable bulb headlamp system which uses identical light sources in all four lamps shall be designed so that the filaments not intended to be used with the lens prescription in front of such filament shall not be illuminated.

12. Paragraph S6.1 is revised is to read:

S6.1 *Photometry.* A replaceable bulb headlamp shall be tested according to paragraph S3.5, Photometric Design Requirements, and Table 1 of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles*, Dec. 1978, or by Figure 15 or 17 of Standard 108, as applicable, after the tests specified in S6.2, S6.4, S6.6, S6.7.1, S6.7.2 and S6.8

13. Paragraphs S6.7 and S6.8 are revised to read:

S6.7 *Temperature and internal heat tests.* A headlamp with one or more standardized replaceable light sources shall be tested according to S6.7.1 and S6.7.2. Tests shall be made with all filaments lighted at design voltage that are intended to be used simultaneously in the headlamp and which in combination draw the highest total wattage. These include but are not limited to filaments used for turn signal lamps, fog lamps, parking lamps, and headlamp lower beams lighted with upper beams when the wiring harness is so connected on the vehicle. If a turn signal is included in the headlamp assembly, it shall be operated at 90 flashes a minute with a 75+/−2% current "on time". If the lamp produces both the upper and lower beam, it shall be tested in both the upper beam mode and the lower beam mode under the conditions above described, except for a headlamp with a single HB1 light source.

S6.7.1 *Temperature cycle.* A headlamp mounted on a headlamp test fixture shall be subjected to 10 complete consecutive cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the lamp shall be energized commencing at point "A" of Figure 6 and de-energized at point "B". Separate or single test chambers may be used to generate the environment of Figure 6. All drain holes, breathing devices or other openings or vents of the headlamp shall be in their normal operating positions.

S6.7.2 *Internal heat test.*

(a) The headlamp lens surface that would normally be exposed to road dirt shall be uniformly sprayed with any appropriate mixture of dust and water or other appropriate materials to reduce the photometric output at the H-V test point of the upper beam (or the 1/2D-1 1/2R test point of the lower beam as appropriate) to 25+/−2% of the output originally measured in the photometric test performed under S4.1.1.36(b). A headlamp with a single HB1 light source shall be tested on the upper beam only. Such reduction shall be determined under the same conditions as that of the original photometric measurement.

(b) After the determination has been made that the photometric output of the lamp has been reduced as specified in S6.7.2(a), the lamp and its mounting hardware shall be mounted in an environmental chamber in a manner similar to that indicated in Figure 7, "Dirt/Ambient Test Setup". The headlamp shall be soaked for one hour at a temperature of 95+7−0 degrees F (35+4−0 degrees C) and then the lamp shall be energized according to S6.7 for one hour in a still air condition, allowing the temperature to rise from the soak temperature.

(c) The lamp shall be returned to a room ambient temperature of 73+7−0 degrees F (23+4−0 degrees C) and a relative humidity of 40+/−10% and allowed to stabilize to the room ambient termperature. The lens shall then be cleaned.

S6.8 *Humidity.* The headlamp mounted on a test fixture shall be placed in a controlled environment consisting of a temperature of 100+7−0°F (38+4−0°C) with a relative humidity of not less than 90%. All drain holes, breathing devices, and other designed openings shall be in their normal operating positions. The headlamp shall be subjected to 20 consecutive 6-hour test cycles. In each cycle, it shall be energized at design voltage with the highest combination of filament wattages that are intended to be used, including a turn signal flashing at 90 flashes a minute with a 75±2% current "on-time, if so equipped, and then de-energized for 5 hours. After completion of the last cycle, the lamp shall be soaked for 1 hour at 73+7−0°F (20+4−0°C) and relative humidity of 40±10% before it is removed for photometric testing. The headlamp shall be tested for photometrics at 10±1 minutes following completion of the humidity test.

14. Section S7 is revised to read:

S7 *Deflection test for standardized replaceable light sources.*

(a) *Type HB1 light source.* With the light source rigidly mounted in a fixture in a manner indicated in Figure 8, apply a force of 4.0±0.1 pounds (17.8±0.4N) at a distance "A" from the reference plane perpendicular to the longitudinal axis of the glass capsule and parallel to the smallest dimension of the pressed glass capsule seal. The force application shall be applied using a rod with a hard rubber tip with a minimum spherical radius of 0.039 in (1 mm). The bulb deflection shall be measured at the glass capsule surface at 180 degrees opposite to the force application.

(b) *Type HB3 and HB4 light sources.* The deflection test is conducted according to paragraph (a), except that the force shall be applied radially to the surface of the glass capsule in four locations in a plane parallel to the reference plane and spaced at a distance "A" from that plane. These force applications shall be spaced 90 degrees apart starting at the point perpendicular to the smallest dimension of the pressed seal of the glass capsule.

15. In Tables II and IV, Column 2 for the Headlamps is revised to read:

Headlamps. . .	On the front, each headlamp providing the upper beam, at the same height, 1 on each side of the vertical centerline, each headlamp providing the lower beam, at the same height, 1 on each side of the vertical centerline, as far apart as practicable. If a single standardized replaceable light source is used to provide the power beam in a headlamp with two standardized replaceable light sources, it shall be the farthest one from the vertical centerline.

16. The title of Figure 3 is revised to read "Specifications for the Type HB1 Standardized Replaceable Light Source."

17. Figure 8 is revised as follows:

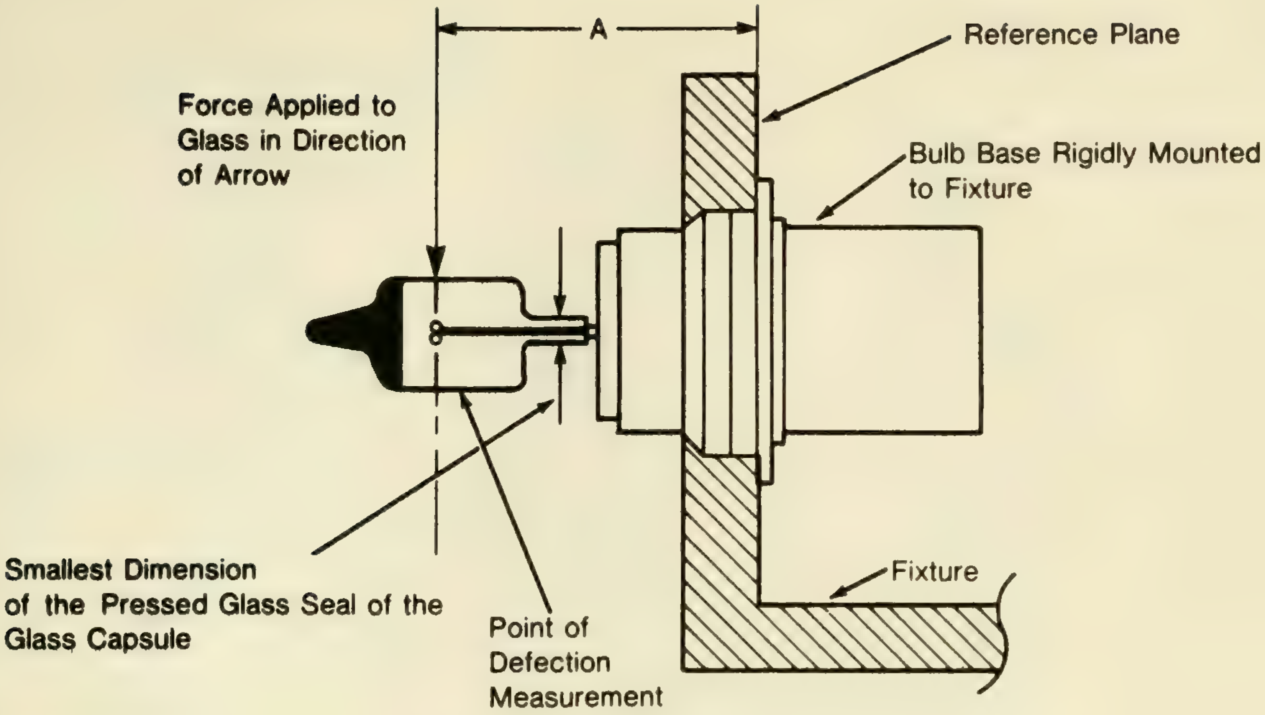
18. New Figures 17, 19 and 20 are added as follows:

Issued on April 28, 1986

Diane K. Steed

Diane K. Steed
Administrator

51 F.R. 16325
May 2, 1986


A
Reference Plane
Force Applied to Glass in Direction of Arrow
Bulb Base Rigidly Mounted to Fixture
Smallest Dimension of the Pressed Glass Seal of the Glass Capsule
Point of Defection Measurement
Fixture

Standardized Replaceable Light Source Type	Dimension "A"
HB1	44.50 ± 0.38 MM (1.75 ± 0.015 In)
HB3	31.50 ± 0.20 MM (1.24 ± 0.008 In)
HB4	31.50 ± 0.20 MM (1.24 ± 0.008 In)

Figure 8 - Bulb Deflection Test

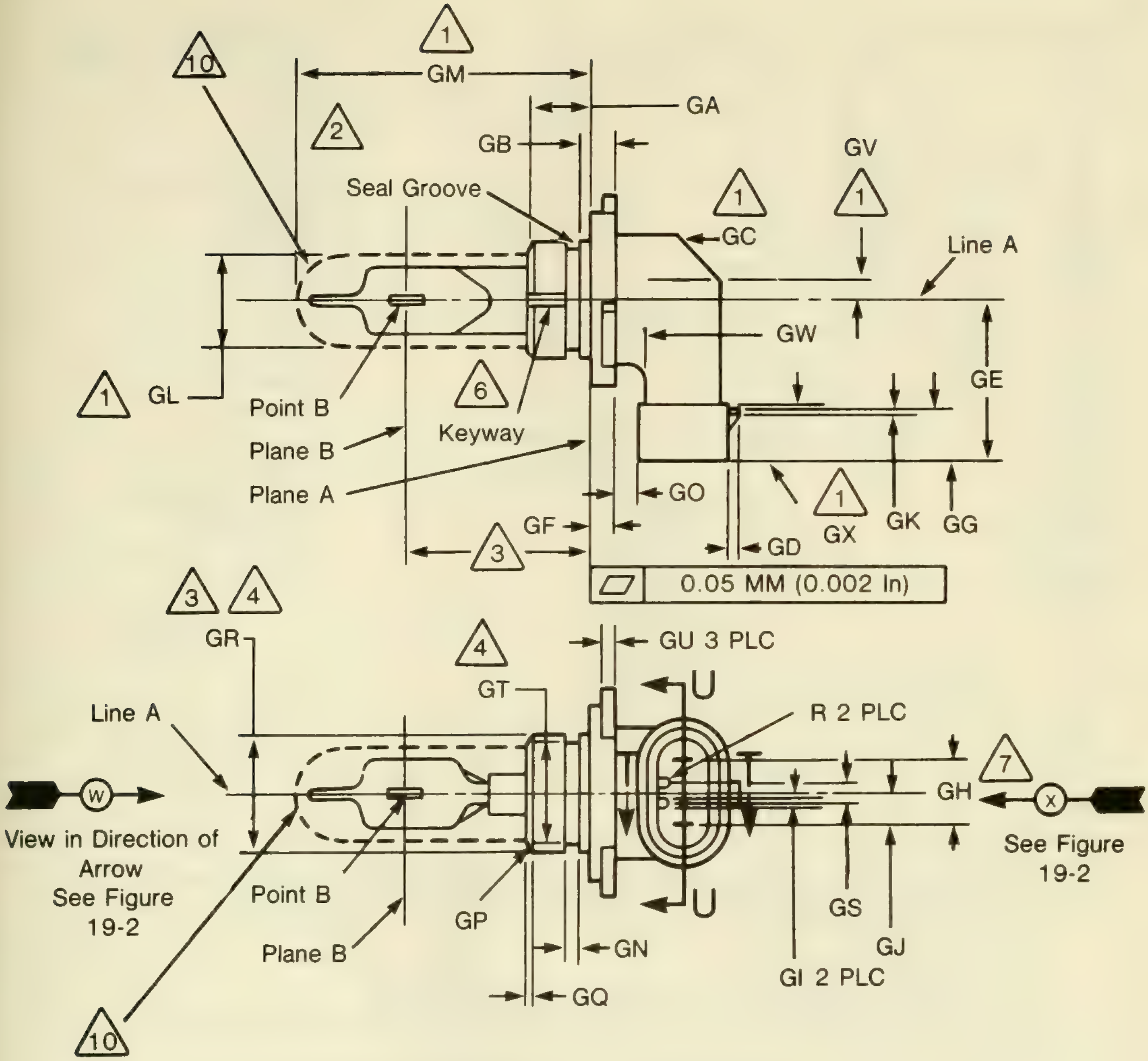


Figure 19 - Specifications for the Type HB3 Standardized Replaceable Light Source

Dimension	Inches	Millimetres
GA	0.591 Max / 0.217 Min	15.00 Max / 5.50 Min
GB	0.236	6.00
GC	45°	45°
GD	0.079	2.00
GE	1.09	27.8
GF	0.165	4.20
GG	0.346	8.80
GH	0.433	11.00
GI	0.055	1.40
GJ	0.217 ± 0.006	5.50 ± 0.15
GK	0.06	1.5
GL	0.775 Dia	19.68 Dia
GM	2.165	55.00
GN	0.093	2.36
GO	0.157	4.00
GP	45° Chamfer	45° Chamfer
GQ	0.039	1.00
GR	0.787 ± 0.002 Dia	22.00 ± 0.05 Dia
GS	0.138	3.50
GT	$0.687\ ^{+0.004}_{-0.000}$ Dia	$17.46\ ^{+0.10}_{-0.00}$ Dia
GU	0.079	2.00
GV	0.138	3.5
GW	0.209 Min	5.30 Min
GX	0.378	9.60

△1 Dimensions Shown Are Maximum-May Be Smaller

△2 Bulbs Must Be Equipped With a Seal. The Bulb-Seal Assembly Must Withstand a Minimum of 69kPA. (10 P.S.I.G.) When the Assembly Is Inserted into a Cylindrical Aperture of 22.22 ± 0.10 MM (0.875 ± 0.004 IN)

△3 See Figure 20-5

△4 Diameters Must Be Concentric Within 0.20 MM (0.008 IN)

△5 Glass Bulb Periphery Must Be Optically Distortion Free Axially Within the Included Angles About Point B

△6 Key and Keyway Are Optional Construction. Keyway Required for Aftermarket Only

△7 Measured at Terminal Base. Terminals Must Be Perpendicular to Base and Parallel Within ± 1.5°

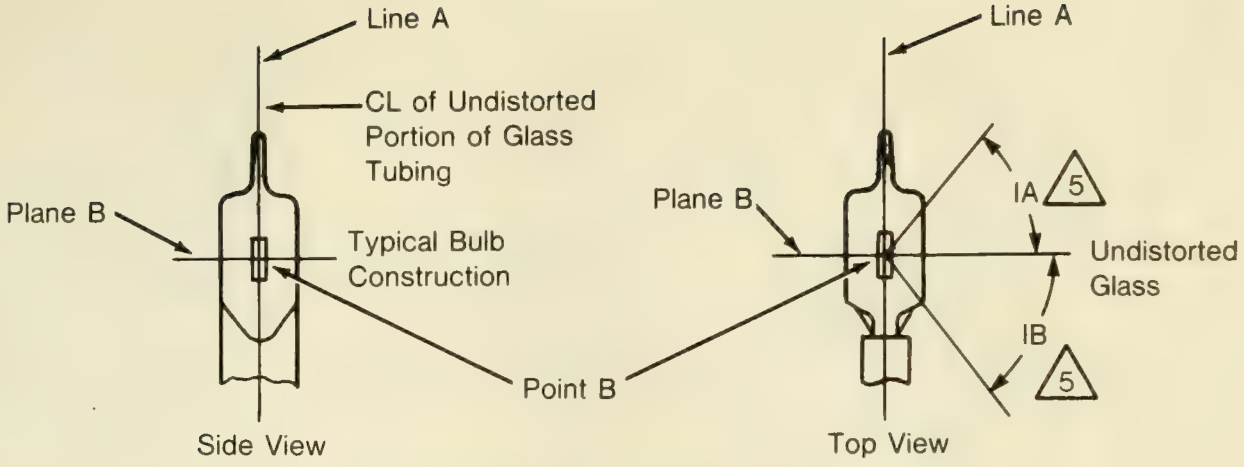
△8 Diameters Must Be Concentric Within 0.20 MM (0.008 IN)

△9 Absolute Dimension, No Tolerance

△10 Glass Capsule and Supports Shall Not Exceed This Envelope

Tolerances Unless Otherwise Specified	
Inches 2 Place Decimals ± .02 3 Place Decimals ± .010 Angular ± 1°	Millimetres 1 Place Decimals ± 0.5 2 Place Decimals ± 0.30 Angular ± 1°

Figure 19 - Specifications for the Type HB3 Standardized Replaceable Light Source (CONT.)



Point B Is Intersection of Plane B and Centerline of Undistorted Glass Tubing

Dimension	Inches	Millimetres
IA	45° Min	45° Min
IB	52° Min	52° Min

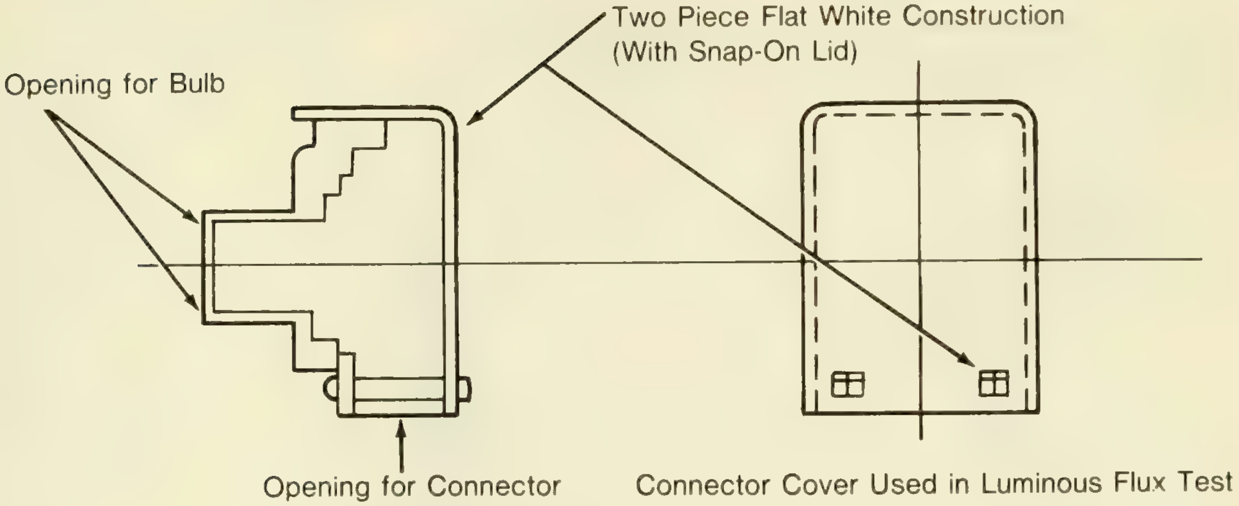
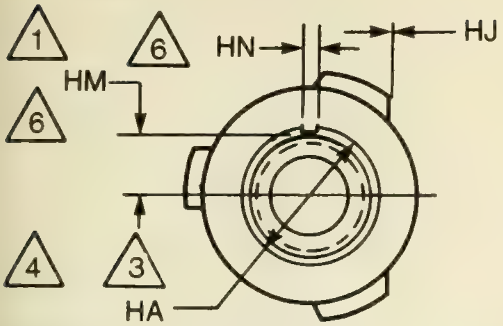
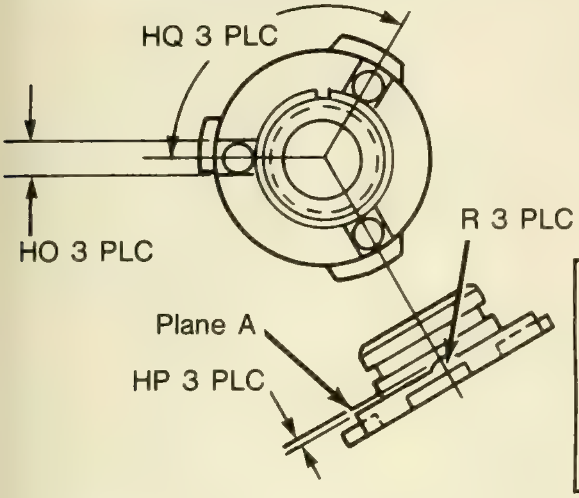

Opening for Bulb
Two Piece Flat White Construction (With Snap-On Lid)
Opening for Connector
Connector Cover Used in Luminous Flux Test

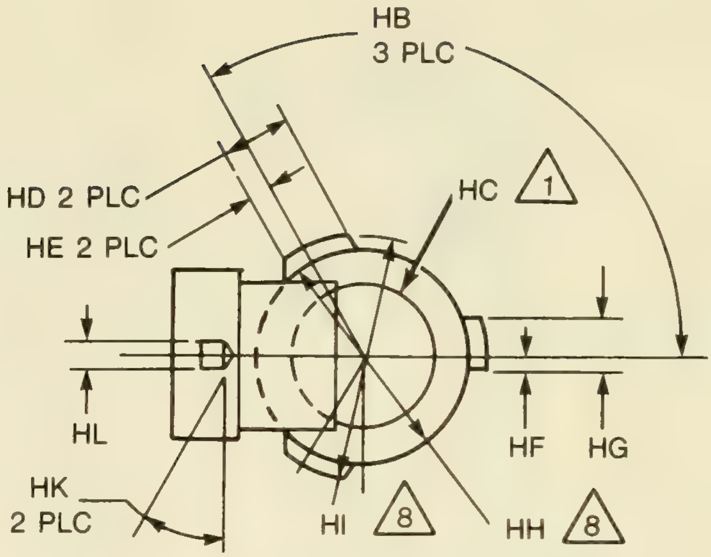
Figure 19-1 - Specifications for the Type HB3 Standardized Replaceable Light Source

View W: from Bulb End



Optional Construction (View W: from Bulb End)



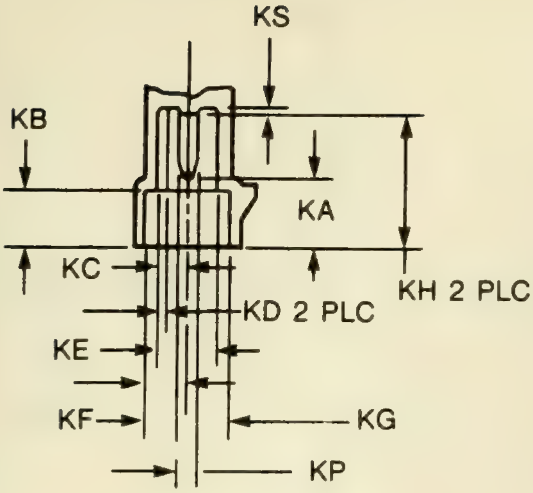


View X: from Connector End

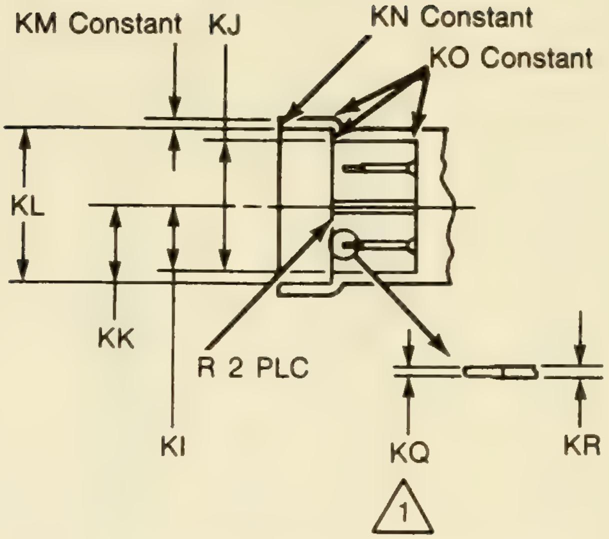
Tolerances Unless Otherwise Specified	
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Dimensions	Inches	Millimetres
HA	0.787 ±0.002 Dia	20.00 ±0.05 Dia
HB	120°±0°30	120°±0°30
HC	0.866 Dia	22.00 Dia
HD	0.394	10.00
HE	0.118	3.00
HF	0.079	2.00
HG	0.315	8.00
HH	1.181 Dia	30.00 Dia
HI	1.417 Dia	36.00 Dia
HJ	3°	3°
HK	30°	30°
HL	0.157	4.00
HM	0.35	8.9
HN	0.079 ±0.004	2.00 ±0.10
HO	0.20	5.0
HP	0.030	0.75
HQ	120° Typ	120° Typ

Figure 19-2 - Specifications for the Type HB3 Standardized Replaceable Light Source



Section T-T (from Fig 19)



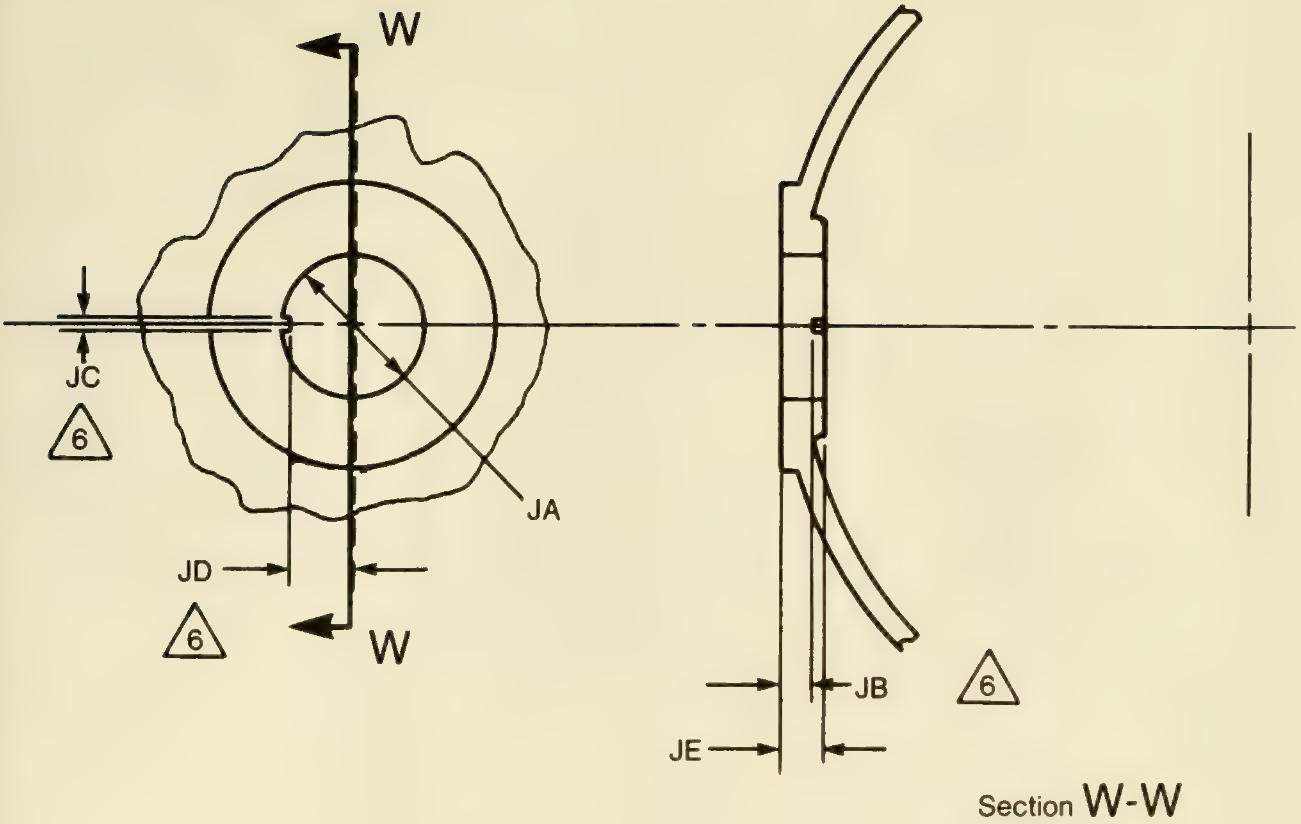
Section U-U (from Fig 19)

Dimensions	Inches	Millimetres
KA	0.384	9.75
KB	0.315	8.00
KC	0.171	4.35
KD	0.055	1.40
KE	0.343	8.70
KF	0.242 ±0.006	6.15 ±0.15
KG	0.484	12.30
KH	0.748	19.00
KI	0.368 ±0.006	9.35 ±0.15
KJ	0.736	18.70
KK	0.439 ±0.006	11.15 ±0.15
KL	0.878	22.30
KM	0.059	1.50
KN	0.03 R	0.8 R
KO	0.016 R	0.40 R
KP	0.110 ±0.004	2.8 ±0.10
KQ	0.024	0.60
KR	0.033 ±0.001	0.83 ±0.03
KS	0.039 Min	1.00 Min

Tolerances Unless Otherwise Specified

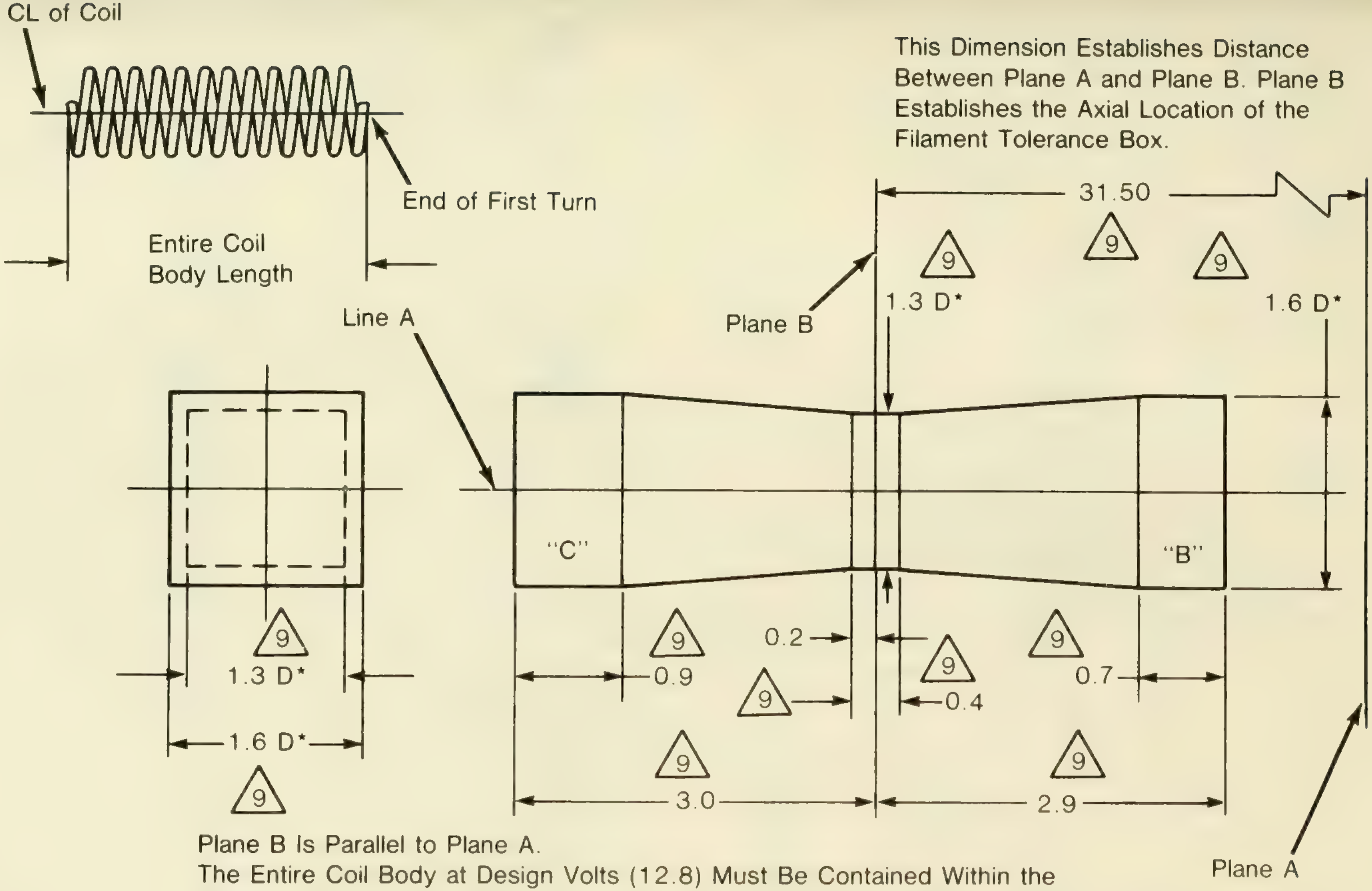
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 19-3 - Specifications for the Type HB3 Standardized Replaceable Light Source



Dimensions	Inches	Millimetres
JA	0.796 ± 0.004 Dia	20.22 ± 0.10 Dia
JB	0.172 +0.010 −0.000	4.36 +0.30 −0.00
JC	0.067 ±0.004	1.70 ±0.10
JD	0.352 +0.004 −0.000	8.95 +0.10 −0.00
JE	0.236 Min	6.00 Min

Figure 19-4 - Specifications for the Type HB3 Standardized Replaceable Light Source Socket (in Reflector)



This Dimension Establishes Distance Between Plane A and Plane B. Plane B Establishes the Axial Location of the Filament Tolerance Box.

Plane B Is Parallel to Plane A.
The Entire Coil Body at Design Volts (12.8) Must Be Contained Within the Volume as Specified. The End of the First Turn of the Coil Must Lie Within Volume "B" and The End of the Last Turn of the Coil Must Lie Within Volume "C"
Line A Is Perpendicular to Plane A and Concentric with the 17.46 MM Diameter of the Base.

*D = Diameter of Filament Coil

Dimensions Shown Are in Millimetres

Figure 19-5 - Specifications for the Type HB3 Standardized Replaceable Light Source

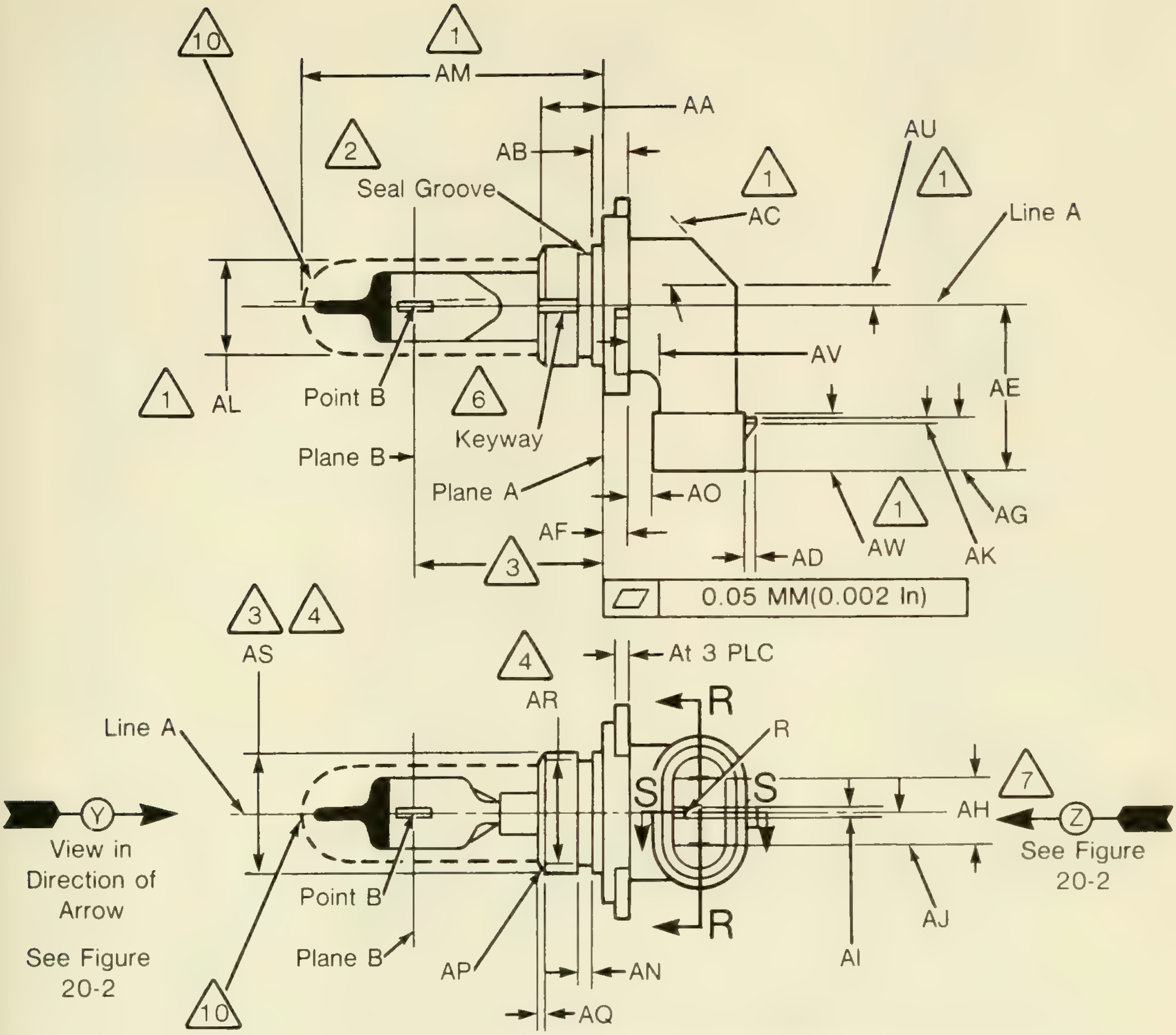


Figure 20 - Specifications for the Type HB4 Standardized Replaceable Light Source

Dimension	Inches	Millimetres
AA	0.591 Max / 0.217 Min	15.00 Max / 5.50 Min
AB	0.236	6.00
AC	45°	45°
AD	0.079	2.00
AE	1.09	27.8
AF	0.165	4.20
AG	0.346	8.80
AH	0.433	11.00
AI	0.055	1.40
AJ	0.217 ± 0.006	5.50 ± 0.15
AK	0.06	1.5
AL	0.780 Dia	19.81 Dia
AM	2.165	55.00
AN	0.093	2.36
AO	0.157	4.00
AP	45° Chamfer	45° Chamfer
AQ	0.039	1.00
AR	$0.766^{+0.004}_{-0.000}$ Dia	$19.46^{+0.10}_{-0.00}$ Dia
AS	0.866 ± 0.002 Dia	22.00 ± 0.05 Dia
AT	0.079	2.00
AU	0.138	3.5
AV	0.209 Min	5.30 Min
AW	0.378	9.60

△1 Dimensions Shown Are Maximum-May Be Smaller

△2 Bulbs Must Be Equipped With a Seal. The Bulb-Seal Assembly Must Withstand a Minimum of 69kPA. (10 P.S.I.G.) When the Assembly Is Inserted into a Cylindrical Aperture of 22.22 ± 0.10 MM (0.875 ± 0.004 IN).

△3 See Figure 20-5

△4 Diameters Must Be Concentric Within 0.20 MM (0.008 IN).

△5 Glass Bulb Periphery Must Be Optically Distortion Free Axially Within the Included Angles About Point B.

△6 Key and Keyway Are Optional Construction. Keyway Required for Aftermarket Only.

△7 Measured at Terminal Base. Terminals Must Be Perpendicular to Base and Parallel Within ± 1.5°.

△8 Diameters Must Be Concentric Within 0.20 MM (0.008 IN).

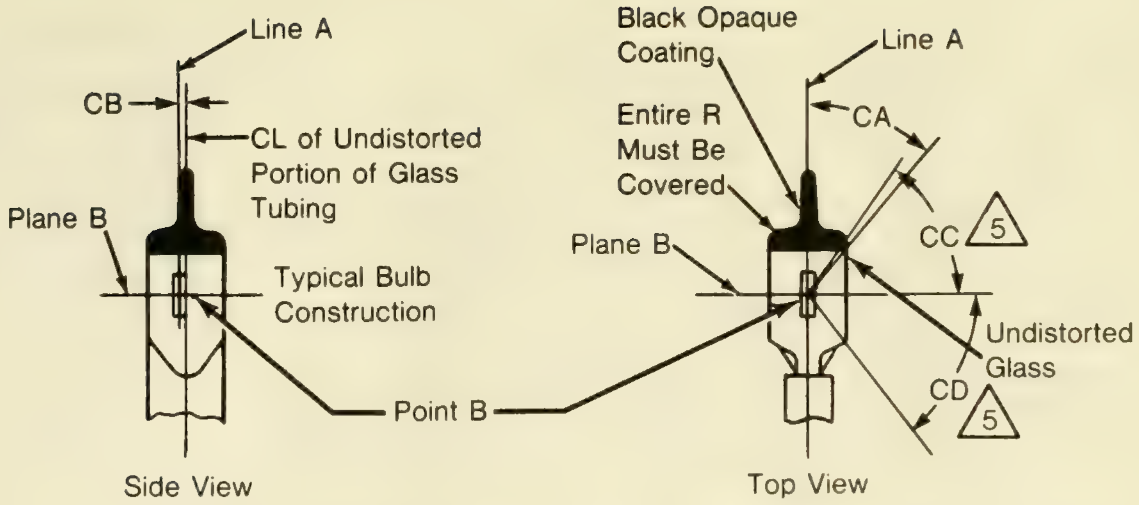
△9 Absolute Dimension, No Tolerance.

△10 Glass Capsule and Supports Shall Not Exceed This Envelope.

Tolerances Unless Otherwise Specified

Inches	Millimetres
2 Place Decimals ± .02	1 Place Decimals ± 0.5
3 Place Decimals ± .010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 20 - Specifications for the Type HB4 Standardized Replaceable Light Source (CONT.)



Point B Is Intersection of Plane B and Centerline of Undistorted Glass Tubing

Dimension	Inches	Millimetres
CA	45° ± 5°	45° ± 5°
CB	0.030 ± 0.020	0.75 ± 0.50
CC	50° Min	50° Min
CD	52° Min	52° Min

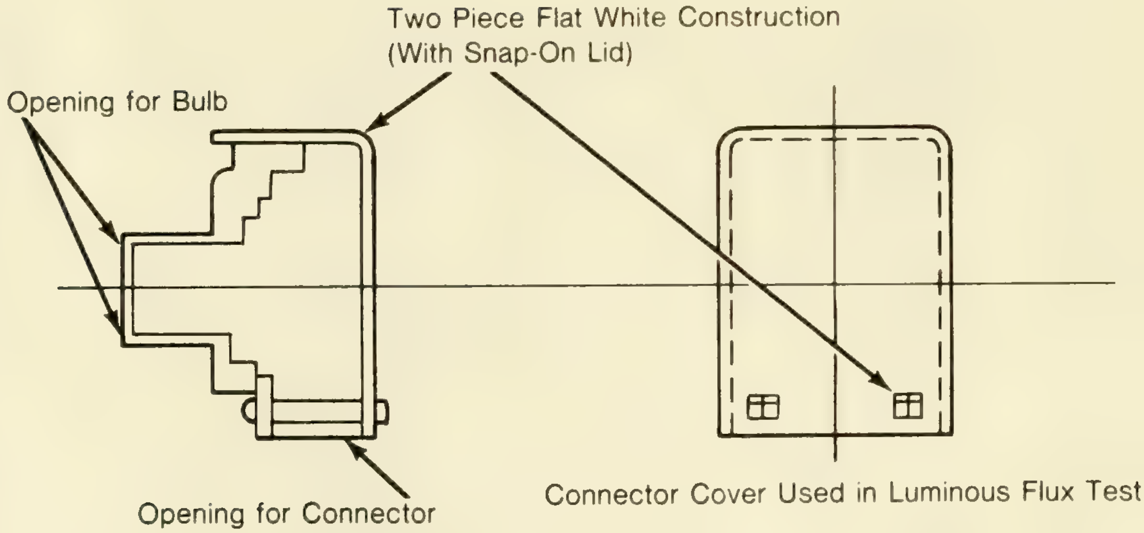
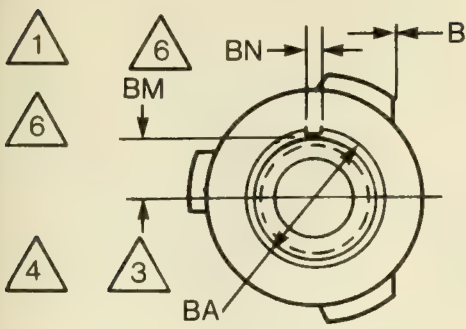
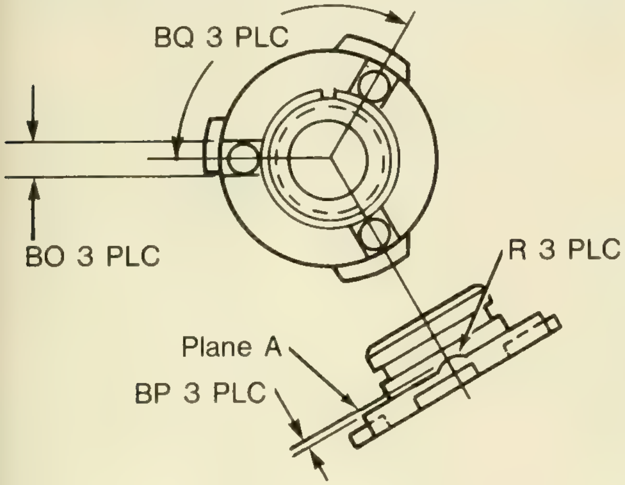

Two Piece Flat White Construction (With Snap-On Lid)
Opening for Bulb
Opening for Connector
Connector Cover Used in Luminous Flux Test

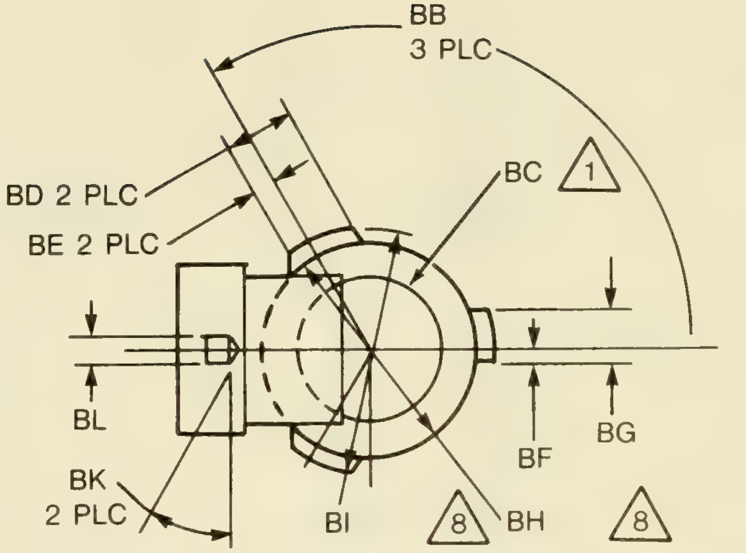
Figure 20-1 - Specifications for the Type HB4 Standardized Replaceable Light Source

View Y: from Bulb End



Optional Construction (View Y: from Bulb End)



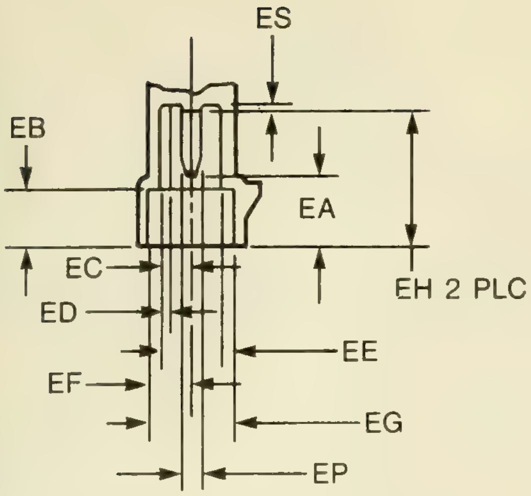


View Z: from Connector End

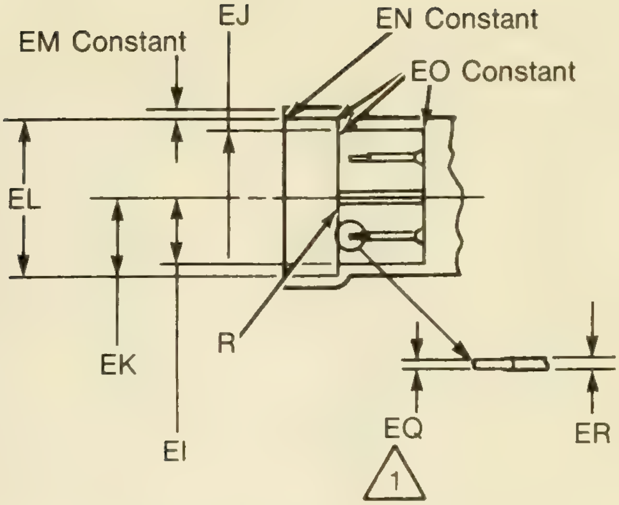
Tolerances Unless Otherwise Specified	
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Dimensions	Inches	Millimetres
BA	0.866 ±0.002 Dia	22.00 ±0.05 Dia
BB	120°±0°30	120°±0°30
BC	0.866 Dia	22.00 Dia
BD	0.394	10.00
BE	0.118	3.00
BF	0.079	2.00
BG	0.315	8.00
BH	1.181 Dia	30.00 Dia
BI	1.417 Dia	36.00 Dia
BJ	3°	3°
BK	30°	30°
BL	0.157	4.00
BM	0.39	9.9
BN	0.079 ±0.004	2.00 ±0.10
BO	0.20	5.0
BP	0.030	0.75
BQ	120° Typ	120° Typ

Figure 20-2 - Specifications for the Type HB4 Standardized Replaceable Light Source



Section S-S (from Fig 20)



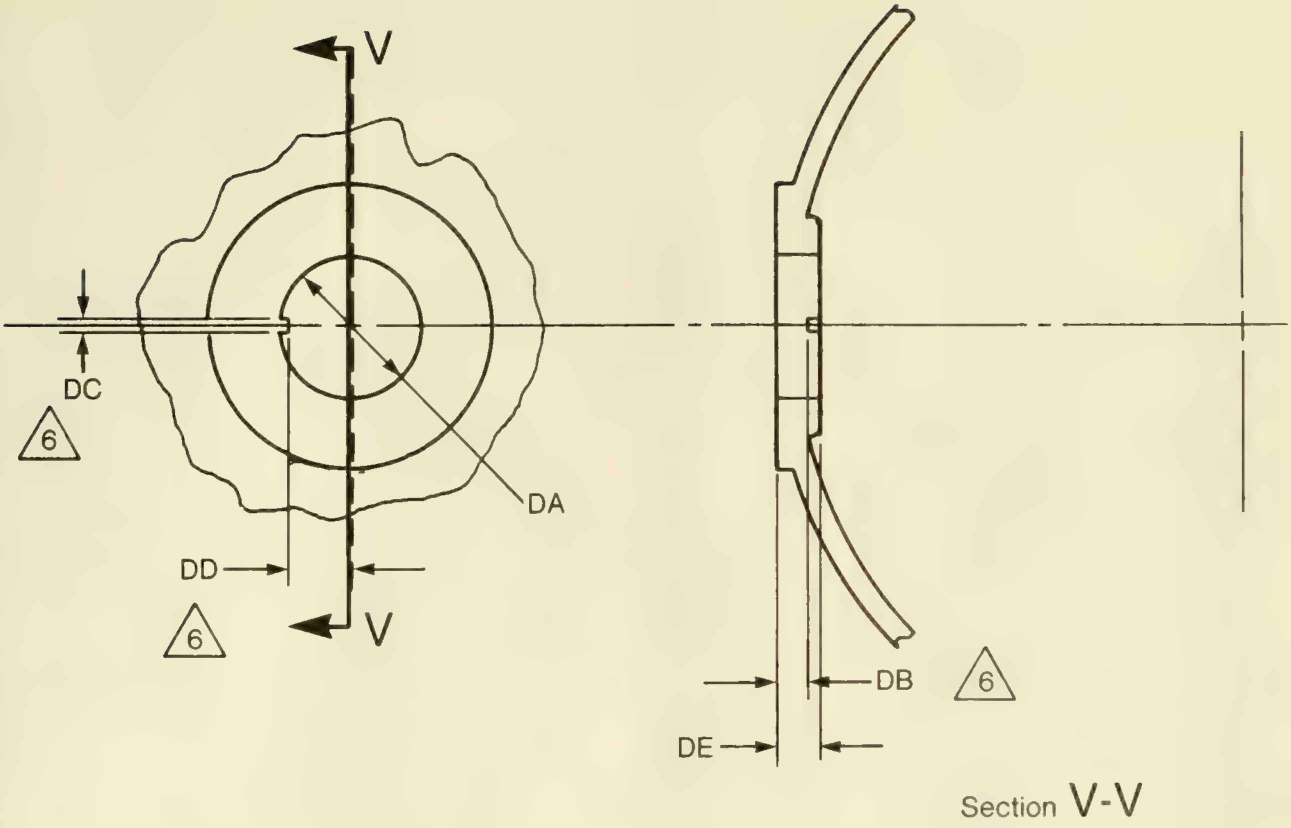
Section R-R (From Fig 20)

Dimensions	Inches	Millimetres
EA	0.384	9.75
EB	0.315	8.00
EC	0.171	4.35
ED	0.079	2.00
EE	0.343	8.70
EF	0.242 ±0.006	6.15 ±0.15
EG	0.484	12.30
EH	0.748	19.00
EI	0.368 ±0.006	9.35 ±0.15
EJ	0.736	18.70
EK	0.439 ±0.006	11.15 ±0.15
EL	0.878	22.30
EM	0.059	1.50
EN	0.03 R	0.8 R
EO	0.016 R	0.40 R
EP	0.110 ±0.004	2.8 ±0.10)
EQ	0.024	0.60
ER	0.033 ±0.001	0.83 ±0.03
ES	0.039 Min	1.00 Min

Tolerances Unless Otherwise Specified

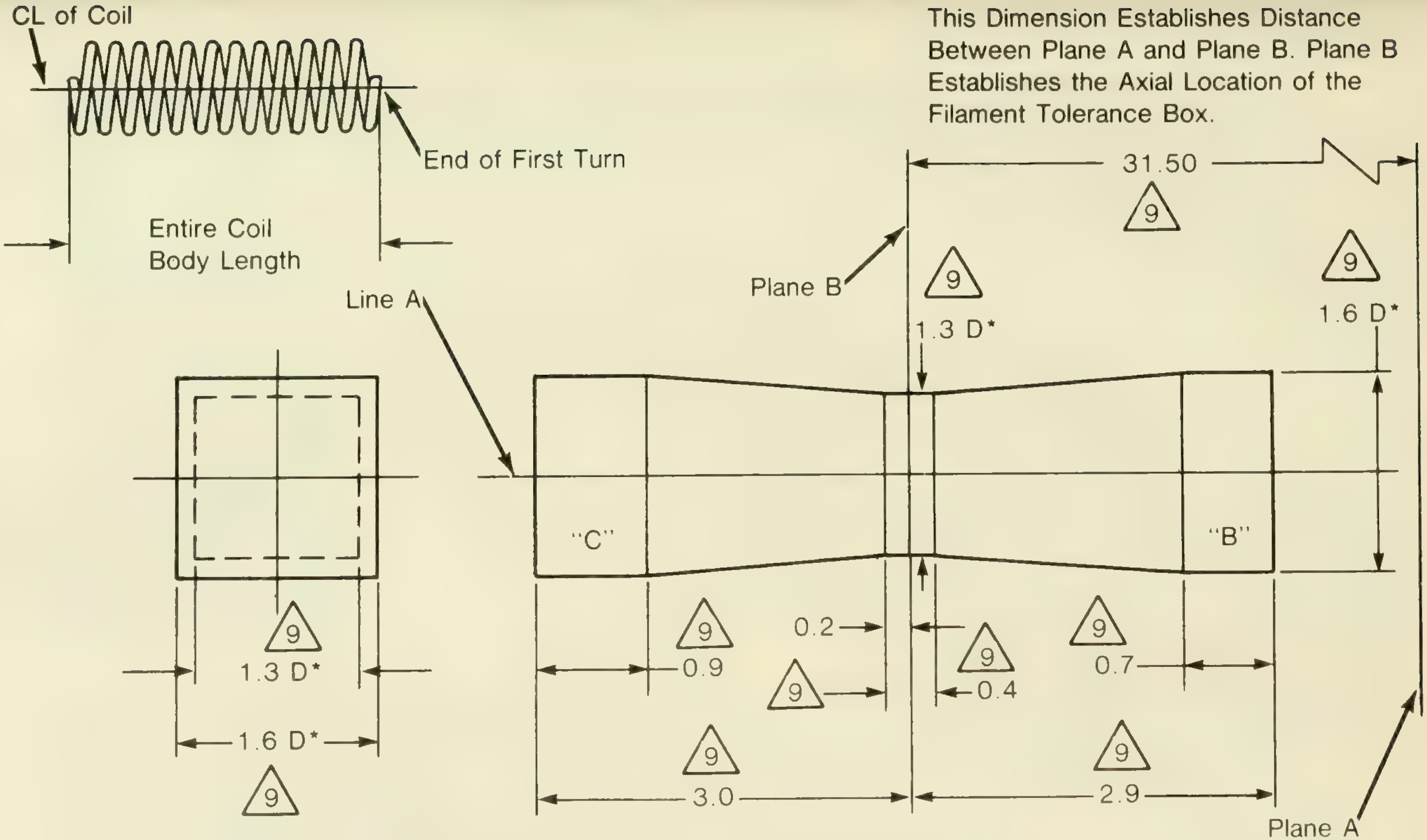
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 20-3 - Specifications for the Type HB4 Standardized Replaceable Light Source



Dimensions	Inches	Millimetres
DA	0.875 ±0.004 Dia	22.22 ±0.10 Dia
DB	0.172 +0.010 −0.000	4.36 +0.30 −0.00
DC	0.067 ±0.004	1.70 ±0.10
DD	0.392 +0.004 −0.000	9.95 +0.10 −0.00
DE	0.236 Min	6.00 Min

Figure 20-4 - Specifications for the Type HB4 Standardized Replaceable Light Source Socket (in Reflector)



This Dimension Establishes Distance Between Plane A and Plane B. Plane B Establishes the Axial Location of the Filament Tolerance Box.

Plane B Is Parallel to Plane A.

The Entire Coil Body at Design Volts (12.8) Must Be Contained Within the Volume as Specified. The End of the First Turn of the Coil Must Lie Within Volume "B" and the End of the Last Turn of the Coil Must Lie Within Volume "C" Line A Is Perpendicular to Plane A and Concentric with the 19.46 MM Diameter of the Base.

*D = Diameter of Filament Coil

Dimensions Shown Are in Millimetres

Figure 20-5 - Specifications for the Type HB4 Standardization Replaceable Light Source

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 14)

ACTION: Response to petition for reconsideration; correction.

SUMMARY: This notice responds to a petition for reconsideration of the May 22, 1985, notice amending Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* to allow motor vehicles to be equipped with replaceable bulb headlamp systems consisting of either four lamps with single standardized replaceable light sources, or two lamps each with two such light sources.

The petition was filed by Ford Motor Company. Petitioner asked for the deletion of paragraph S4.5.8 which prohibits simultaneous activation of the upper and lower beams of a four lamp system each containing a single standardized replaceable light source, claiming that the agency has shown no safety need for it. The petition is denied because of the potential that combined beam use could result in more than 75,000 candela emission at the H-V test point on each side of the vehicle and more than 5,000 candela at the 4D-V test point. This could cause excess glare down the road to oncoming drivers and excess glare in the foreground.

Petitioner also called attention to duplicative language in paragraph S4.1.1.36(a)(2). Its petition for correction is granted and the standard is amended to remove that language.

EFFECTIVE DATE: July 2, 1986.

SUPPLEMENTARY INFORMATION: On May 22, 1985, NHTSA published a notice amending 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* (50 FR 21052). The amendment allowed motor vehicles to be equipped with replaceable bulb headlamp systems consisting of either four lamps, each with a single standardized replaceable light source, or two lamps each with two such light sources. Included in the amendment was the prohibition against simultaneous activation (except momentarily for temporary signalling use) of the upper and lower beams of a headlighting system consisting of four lamps each with its own single light source.

On June 21, 1985, Ford Motor Company petitioned for reconsideration of the prohibition, claiming it was an "unwarranted new design restrictive requirement." Citing the agency's rationale for the prohibition, as expressed in the preamble to the notice (the photometric requirements of SAE J579c do not contemplate such use), Ford argued that "no data were presented or referenced by NHTSA in support of this claim, nor have any data been presented to suggest that activating the lower beam simultaneously with the upper beam presents any risk to motor vehicle safety." In Ford's opinion, "Such use of combined beams may well improve the overall upper beam performance and therefore contribute to motor vehicle safety (indeed such use is contemplated by NHTSA in its rulemaking for Type F sealed beam headlamps)." Ford observed that "As no vehicle manufacturer, to our knowledge, has ever marketed a vehicle in which the upper and lower beam could be combined, except as part of a "flash to pass" feature, there is no practical evidence that such a system would harm motor vehicle safety." Ford concluded by suggesting "that if the agency wishes to continue rulemaking in this area, the appropriate course of action would be to issue a notice of proposed rulemaking which would provide both detailed reasons and demonstrate a safety need for such a prohibition."

NHTSA believes that the rulemaking history of paragraph S4.5.8 and the discussion in Notice 3 of Docket 84-04, May 13, 1985, for simultaneous beam use in the Type F system, demonstrate the need for such a prohibition and has offered ample opportunity for public comment. As NHTSA noted in the preamble to the final rule (p. 21054) "A second issue of concern to commenters was the proposed prohibition against simultaneous use of upper and lower beams in a four-lamp system if the J579c photo metrics were allowed, as contrasted with the lack of such a prohibition for systems with Type F photometrics."

Under Standard No. 108, the maximum candela at the H-V test point of the upper beam cannot exceed 75,000 on each side of the front of the vehicle. Beyond that, as the agency has noted, benefits attributable to increased light output rapidly diminish, and the possibility of glare greatly increases. There are also restrictions on the maximum intensity of upper beam light permitted at the 4D-V test point.

The primary reason for not permitting simultaneous use of upper and lower beams in four-lamp, four-light source systems is the potential for such use to result in situations where the photometric limits are exceeded at these test points. These situations may arise because of the way headlamp units are defined in the standard, and because of the way photometric requirements apply to these units.

The photometric tables, in this case from SAE J579c, pertain to a headlamp unit, not to individual filaments or bulbs that may be a part of the unit. Standard No. 108 applies only Table 1 to replaceable bulb headlamps, which provides for a single lower beam, and/or a single upper beam to be produced by a headlamp unit. Thus, in the case of the two-lamp, four-light source system, the standard does not place any limitations on how the photometric requirements for each lamp are to be met as long as the lamp provides a lower beam and an upper beam. Manufacturers are allowed to design lamps to produce the required light patterns with one of the light sources or both of the light sources present in the headlamp because they have complete control over lamp design. Manufacturers can determine how much each light source, reflector, and lens component within each headlamp unit will contribute in producing the required lower beam light and the upper beam light.

Such is not the case in the four-lamp, four-light source system. Here, each lamp must be designed to conform with either the lower beam requirements *or* the upper beam requirements of SAE J579c, Table 1. Thus, it is conceivable that when a lower beam lamp from one manufacturer is activated simultaneously with an upper beam lamp from another manufacturer, as could occur with replacement lamps, the combined output might exceed the photometric maximums allowed at certain critical test point locations such as H-V, or 4D-V.

Some vehicle manufacturers might volunarily equip their products with four lamp systems where the combined output would not exceed maximum limits, but consumers would have no guarantee of this. The potential for mismatch would be even greater when the vehicle owner is required to purchase a replacement lamp in the aftermarket. For lamp units designed to conform with SAE J579c, the only way to prevent the possibility of excessive and potentially unsafe combinations of lamp output, is to prohibit their simultaneous use.

Ford also called the agency's attention to the amendment to S4.1.1.36(a)(2) effectuated on May 22 which added five sentences (not four as the amendatory language mistakenly stated). The first new sentence is redundant with the unamended existing first sentence to the section. Ford recommended removing the second sentence that was added on May 22, i.e., "The lens of each replaceable bulb headlamp shall have three pads which meet the requirements of Figure 4."

The agency agrees that there is a redundancy, and has granted Ford's petition; but it has chosen to remove the existing first sentence, rather than the second sentence added on May 22. The text to be deleted describes the aiming pads, the aiming plane, and the method for determining the settings for the adjustable aiming device locating plate. It states that the aiming pads form the aiming plane which is no longer true. The pads are used for positioning the aimer legs. The aimer legs, having been set to the correct setting as engraved on the lamp lens, determine the aiming plane.

In consideration of the foregoing, 49 CFR 571.108, Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment,* is amended as follows:

The first two sentences of paragraph (a)(2) of paragraph S4.1.1.36 are removed, and the following sentence is added to read:

(a)(2) The lens of each replaceable bulb headlamp shall have three pads which meet the requirements of Figure 4, *Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units.*

Issued on June 27, 1986.

Barry Felrice
Associate Administrator
for Rulemaking
51 F.R. 24152
July 2, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 85-10; Notice 2)

ACTION: Final Rule.

SUMMARY: This notice makes nonsubstantive amendments to Federal Motor Vehicle Safety Standard No. 108 to remove original equipment requirements that are no longer in effect and to clarify that most of those requirements may still be met by equipment manufactured to replace such original equipment, to adopt a common typographical manner in referring to materials incorporated by reference, and to correct errors appearing in the *Code of Federal Regulations.*

EFFECTIVE DATE: August 6, 1986.

SUPPLEMENTARY INFORMATION: The agency has recently reviewed 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* as published in the *Code of Federal Regulations,* revised as of October 1, 1985. In so doing, it noted three subject areas where nonsubstantive amendments could be made to clarify and simplify the standard, to remove inconsistencies in titles of SAE of other materials incorportaed by reference, and to correct minor errors.

Clarification of Current Coverage

Standard No. 108 contains certain requirements that applied to vehicles manufactured between certain dates in the past. For example, Paragraph S4.1.1.6 permitted stop lamps on vehicles manufactured between January 1, 1973, and September 1, 1978, to be designed to conform to SAE Standard J586b *Stop Lamps,* as an exception to the requirement for SAE J586c stop lamps in Table III. Although stop lamps meeting J586b may no longer be used as original equipment on passenger cars, their manufacture as replacements for original equipment J586b stop lamps remains permissible. Therefore, the agency is revising S4.1.1.6 in part, from "Each stop lamp on any motor vehicle manufactured between January 1, 1973, and September 1, 1978, may be designed to conform to SAE Standard J586b. . . " to "Each stop lamp manufactured to replace a stop lamp designed to conform to SAE Standard J586b *Stop Lamps,* June 1966, may also be designed to conform to SAE Standard J586b. . ." Similar changes are made to paragraphs S4.1.1.7, S4.1.1.28, S4.1.1.29, and S4.1.1.35. Paragraph S4.1.1.19 and 20 apply to lamps manufactured on or after January 1, 1974; there appears to be no need to retain the effective date on this requirement, nor for the effective date of the lens marking requirement in paragraph S4.1.1.21, and the second paragraph of its subsection (f). Paragraph S4.1.2(a) applies to plastic materials manufactured before January 1, 1976, and may be deleted. Succeeding subparagraphs are redesignated, and references to J576b are deleted.

Consistency in SAE, OSHA, and ASTM References.

Titles of SAE, OSHA, and ASTM materials incorporated by reference appear at some place in the standard in quotation marks, and at other places in italics. The agency has concluded that the style of reference should be consistent, and that italics are preferable to quotation marks because the presence of incorporated materials will be more readily apparent to the reader. Changes from quotation marks to italics are made in the following paragraphs: S.4.1.1.1, S4.1.1.4, S4.1.1.8, S4.1.1.13(a), (b), and (c), S4.1.1.19, S4.1.1.20, S.4.1.1.22, S4.1.1.25, S4.1.1.36(b)(1), (2), and (3), S4.1.1.36(d)(1), (3), (5), (6)(A) and (B), and (7), S4.1.2 (ASTM reference), S.4.1.4(a) and (b), S4.2.1, S4.3.1.5, S4.3.1.7, S4.5.1, S4.5.6, S6.1, S6.4(b)(1) (OSHA reference), S6.5 (ASTM reference), S6.6 (ASTM reference), and S6.7.2(b)(2) and (c)(2) (Title of Figure 7).

Typographical Errors

Typographical errors appear in the following sections and will be corrected: S4.1.1.43(c)(2), and S4.4.1 (this designation is unnecessary as there is no longer a paragraph S4.4.2, and an appropriate correction is made).

In consideration of the foregoing 49 CFR Part 571 and 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* are amended as follows:

1. In paragraph S4.1.1.1, paragraph S4.3.1.7, and paragraph S4.5.6, the words "Turn Signal Lamps" are changed to read *"Turn Signal Lamps"*.

2. In paragraph S4.1.1.4 the words "Sheeting and Tape, Reflective Non-exposed Lens, Adhesive Backing" are revised to read *"Sheeting and Tape, Reflective Non-exposed Lens, Adhesive Backing"*, and the words "Reflex Reflectors" are changed to read *"Reflex Reflectors"*.

3. In paragraph S4.1.1.6 the following changes are made:

(a) The first sentence is revised to read "Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586b *Stop Lamps,* June 1966, may also be designed to conform to J586b."

(b) The third sentence is revise by inserting the words "manufactured for use" between the words "Each such lamp" and "on a passenger car".

4. In paragraph S4.1.1.7 the following changes are made:

(a) The first sentence is revised to read "Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588d, *Turn Signal Lamps,* June 1966, may also be designed to conform to J588d."

(b) The third sentence is revised by inserting the words "manufactured for use" between the words "Each such lamp" and "on a passenger car."

(c) The last sentence is revised by inserting the words "manufactured for use" between the words "Each such lamp" and "on a multipurpose passenger vehicle".

5. In paragraph S4.1.1.8 the words "Clearance, Side Marker, and Identification Lamps" are changed to *"Clearance, Side Marker, and Identification Lamps"*.

6. In paragraph S4.1.1.13(a) the words "Dimensional Specifications for Sealed Beam Units for Motor Vehicles" are changed to *"Dimensional Specifications for Sealed Beam Headlamps Units"*.

7. In paragraph S4.1.1.13(b), paragraph S4.1.1.36(b)(2), paragraph S4.1.1.36(d)(1), (d)(3), (d)(5), paragraph S4.1.1.36(d)(6)(A), (6)(B), and (6)(C), paragraph S4.1.1.36(d)(7) and paragraph S6.1 the words "Sealed Beam Headlamp Units for Motor Vehicle" are changed to *"Sealed Beam Headlamp Units for Motor Vehicles"*.

8. In paragraph S4.1.1.13(c) and paragraph S4.1.1.36(b)(3), the words "Seal Beam Headlamp Assembly" are changed to *"Sealed Beam Headlamp Assembly"*.

9. In paragraph S4.1.1.19 (a) the words "manufactured on or after January 1, 1974, and" are deleted.

10. In paragraph S4.1.1.20, the words "manufactured on or after January 1, 1974" are deleted.

11. In paragraph S.4.1.1.19 and S4.1.1.20, (b) the words "Lamp Bulbs and Sealed Units" are changed to *"Lamp Bulbs and Sealed Units"*.

12. In paragraph S4.1.1.21, the words "manufactured on or after July 1, 1979" are deleted.

13. The second paragraph of S4.1.1.21(f) is deleted.

14. In paragraph S4.1.1.22, the words "Backup Lamps" are changed to *"Backup Lamps,* February 1968".

15. In paragraph S4.1.1.35, the words "Backup Lamps" are changed to *"Backup Lamps"*.

16. Paragraph S4.1.1.25 is amended as follows:

(a) The words "Dimensional Specifications for Sealed Beam Headlamp Units" are changed to *"Dimensional Specifications for Sealed Beam Headlamps Units"*.

(b) The words "142 mm × 200 mm Sealed Beam Headlamp Unit" are changed to *"142 mm × Sealed Beam Headlamp Unit"*.

17. Paragraph S4.1.1.28 is revised to read:

S4.1.1.28 Each taillamp manufactured to replace a taillamp designed to conform to SEA Standard J585d *Tail Lamps,* August 1970, may also be designed to conform to J585d.

18. Paragraph S4.1.1.29 is revised to read:

S4.1.1.29 Each turn signal lamp manufactured to replace a turn signal lamp (on a motorcycle) that was designed to conform to SAE Standard J588d, *Turn Signal Lamps,* June 1966, may also be designed to conform to J588d.

19. Paragraph S4.1.1.35 is revised to read:

S4.1.1.35 Each headlamp manufactured to replace a headlamp designed to conform to SAE Standard J580a, *Sealed Beam Headlamp,* June 1966, may also be designed to conform to J580a.

20. Paragraph S4.1.1.36(b)(1) is revised to read:

(1) Section 4.6—Photometry of SAE J575 JUN 80 *Tests for Motor Vehicle Lighting Devices and Components.*

21. The following changes are made to paragraph S4.1.1.43:

(a) In subparagraph (c)(2), the word "amiable" is change to "aimable"

(b) In subparagraph (e), the words "August 1979" are changed to "AUG 79".

(c) In subparagraph (e)(5), the words "October 1980" are changed to "OCT 80 *Headlamp Aiming Device for Mechanically Aimable Sealed Beam Headlamp Units"*

22. In paragraph S4.1.1.44 subparagraph "(1)" is changed to "(a)".

23. The following changes are made to paragraph S4.1.2:

(a) Subparagraph (a) is deleted, and subparagraph (b), (c), and (d) are redesignated "(a)", "(b)", and "(c)" respectively.

(b) Redesignated subparagraph (a) is revised to read:

(a) Plastic lenses used for inner lenses or those covered by another material and not exposed directly to sunlight shall meet the requirements of paragraphs 3.4 and 4.2 of SAE J576c when convered by the outer lens or other material;

(c) In redesignated subparagraph (b) the words "Haze and Luminous Transmittance of Transparent Plastic" are changed to *"Haze and Luminous Transmittance of Transparent Plastic"*.

(d) Redesignated subparagraph (c) is revised to read:

(c) After the outdoor exposure test, plastic materials used for reflex reflectors shall meet the appearance requirements of paragraph 4.2.2. of SAE J576c.

24. In paragraph S4.1.4(a) and (b), and in paragraph S4.2.1, the words "School Bus Red Signal Lamps" are changed to *"School Bus Red Signal Lamps"*.

25. Paragraph S4.1.5 is revised to read:

S4.1.5 The color in all lamps, reflective devices, and associated equipment to which this standard applies shall comply with SAE Standard J578c, *Color Specifications for Electric Signal Lighting Devices*, February 1977.

26. Paragraph S4.4 *Equipment combinations* is amended by deleting the numbers "S4.4.1".

27. The following changes are made to paragraph S4.5.1:

(a) The words "Headlamp Beam Switching" are changed to *"Headlamd Beam Switching"*.

(b) The words "Semi-Automatic Headlamps Beam Switching Devices" are changed to *"Semi-Automatic Headlamp Beam Switching Devices"*.

28. In paragraph S6.3 the words "Tests for Motor Vehicle Lighting Devices and Components" are changed to read *"Tests for Motor Vehicle Lighting Devices and Components"*.

29. In paragraph S6.4(b)(1) the words "Handling Storage and Use of Flammable Combustible Liquids" are changed to *"Handling Storage and Use of Flammable Combustible Liquids"*.

30. S6.5(a) the words "August 1979" are revised to read "AUG 79 *Sealed Beam Headlamp Assembly"*.

31. In paragraph S6.5(b) the words "Method of Salt Spray (FOG) Testing" are changed to *"Method of Salt Spray (FOG) Testing"*.

32. In paragraph S6.6 the words "specification for Portland Cement" are changed to *"Specification for Portland Cement"*.

33. In paragraphs S6.7.2(a)(2), (b)(2), and (c)(2) the words "Dirt-Ambient Test Setup" are revised to read *"Dirt/Ambient Test Setup"*.

34. In paragraph S6.7.2(c)(3) the tolerances on relative humidity of '30 + 10%" are changed to "30 ± 10%".

35. In paragraph S6.8 the tolerance of "73 ± 7 − 0 °F (20 ± 4-0 °C)" are changed to "73 + 7 − 0 °F (20 + 4 − 0 °C)"

36. In S4.1.1.36(b)(3) the words "SAE J580 Sealed Beam Headlamp Assembly August 1979" are revised to read "SAE J580 AUG 79 *Sealed Beam Headlamp Assembly"*.

Issued on July 31, 1986

Diane K. Steed
Administrator

51 F.R. 28238
August 6, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 19)

ACTION: Correction.

SUMMARY: This notice corrects errors occurring in the final rule published on May 2, 1986, adopting HB3 and HB4 light sources for replaceable bulb headlamps. The notice also clarifies an apparent discrepancy between the amendment published on May 2, and an amendment published on May 7 with reference to the amendment of paragraph S4.1.1.38 and its redesignation as paragraph S4.1.1.39. An error in Figure 13 is corrected. An explanation is provided with respect to two of the nonsubstantive amendments published on August 8, 1986.

EFFECTIVE DATE: The corrections are effective October 2, 1986.

SUPPLEMENTARY INFORMATION: During the first week of May 1986 the agency published two notices amending Standard No. 108. The notice that appeared on May 2 (51 FR 16325) adopted the HB3 and HB4 light sources for use in replaceable bulb headlamps, and redesignated the existing light source as HB1. This amendment was not effective until June 2. Several days later, on May 7, a notice was published (51 FR 16847) amending the specifications for the existing light source, but this notice was effective upon publication.

When read in order of publication, some confusion results. The notice of May 2 removes S4.1.1.39, redesignates S4.1.1.40 as S4.1.1.38 and revises it, and redesignates S4.1.1.38 as S4.1.1.39 and revises it. The notice of May 7 revises S4.1.1.38. It is impossible to revise S4.1.1.38 (formerly S4.1.1.40) as adopted on May 2 on the basis of the revision of S4.1.1.38 published on May 7. However, there should be no confusion when revision is made on the basis of the effective dates of May 7 and June 2: S4.1.1.38 (as it appears in 49 CFR 571.108 as of October 1, 1985) is revised for the period May 7-June 2, 1986; on June 2 S4.1.1.38 is redesignated as S4.1.1.39 and further revised. On June 2 the existing S4.1.1.40 becomes the new S4.1.1.38 and is revised in certain respects. Because amendments are effective on the date specified, there is no legal reason to republish the May 2 amendments, and the agency regrets any confusion that may have been caused by publication of the notices out of sequence.

The notice of May 2, however, does contain errors in the text of S6.7.2(c) and S6.8. In both these sections the value of relative humidity is given as 40 plus or minus 10%. Although this was the value initially proposed, between the time of the proposal and the rule NHTSA had adopted 30% as the value in another rulemaking (50 FR 21052, May 22, 1985); therefore correction is made to specify 30 plus or minus 10%. In the amendment redesignating S4.1.1.38 as S4.1.1.39, the plus sign was inadvertently omitted from the general specification for lower beam of the HB1 light source, and the word "Engineering" was omitted from the title of the Illuminating Engineering Society of North America. In paragraph S4.5.8 the word "replacement" should have been "replaceable."

General Motors has brought to the agency's attention the fact that the value for dimension AB in Figure 11 is properly .56 inch rather than .54 inch, and an appropriate correction is made.

The agency has found an error in Figure 13 pertaining to the Type LF headlamp unit, in which letters representing Dimensions C and L were transposed. This notice republishes Figure 13 to correct that error.

Finally, the nonsubstantive amendments published on August 6, 1986, (51 FR 28238) purported to change paragraphs S6.7.2(a)(2), (b)(2), and (c)(2), and S6.7.2(c)(3); however, the three subparagraphs (2), and subparagraph (3) were eliminated by the amendments published on May 2, so that the purported amendments are without legal effect.

Because the amendments are corrective in nature and impose no additional burdens on any person, it is hereby found that for good cause shown that an effective date earlier than 180 days after issuance of the rule is in the public interest, and the amendment is effective upon publication in the *Federal Register.*

In consideration of the foregoing Part 571 is amended as follows:

In Subparagraph (b) of paragraoh S4.1.1.39 the lower beam for the HB1 Specification is changed from "700 - 15 percent" to "700 ± 15 percent."

In Subparagraph (d) of paragraph S4.1.1.39 the word "Engineering" is inserted between the words "Illuminating" and "Society."

In Paragraph S4.5.8 the word "replacement" is corrected to read "replaceable."

Subparagraph (c) of paragraph S6.7.2 is revised by changing the numeral "40" to "30."

In the penultimate sentence of paragraph S6.8 the numeral "40" is changed to "30."

In Figure 11 the value ".54" for letter AB occurring under the column headed "Inch" is changed to ".56."

In Figure 13 under the diagram pertaining to the Type LF headlamp unit, the letters "C REF" and "L" are transposed.

Issued on September 26, 1986

Barry Felrice
Associate Administrator
for Rulemaking

51 F.R. 35222
October 2, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 81-11; Notice 20)

ACTION: Corrections.

SUMMARY: This notice corrects two errors appearing in the final rule published on May 2, 1986, adopting HB3 and HB4 light sources for replaceable bulb headlamps, specifically in paragraphs S6.7.2(b) and S6.8.

EFFECTIVE DATE: The corrections are effective October 3, 1986.

SUPPLEMENTARY INFORMATION: NHTSA published a final rule on May 2, 1986, amending Federal Motor Vehicle Safety Standard No. 108 (51 FR 16325) which, in pertinent part, revised the internal heat test and humidity test for replaceable bulb headlamps (paragraph S6.7.2 and S6.8 respectively). In paragraph S6.7.2(b) the Celsius value for the headlamp soak temperature was mistakenly given as "34 + 4 - 0 degrees C;" the correct value is "35 + 4 - 0 degrees C." In paragraph S6.8 the Celsius value for the headlamp soak temperature was erroneously given as "20 + 4 - 0 degrees C;" the correct value is "23 + 4 - 0 degrees C". These errors are corrected.

Because the amendments are corrective in nature and impose no additional burdens on any person, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance of the rule is in the public interest, and the amendments are effective upon publication in the *Federal Register.*

In consideration of the foregoing Part 571 is amended as follows:

Sec. 571.108 (Corrected)

In the final sentence of subparagraph (b) of paragraph S6.7.2, the numeral "34" is changed to "35."

In the penultimate sentence of paragraph S6.8 the numeral "20" is changed to "23."

Issued on October 1, 1986

Barry Felrice
Associate Administrator
for Rulemaking
51 F.R. 35357
October 3, 1986

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment

(Docket No. 85-02; Notice 2)

ACTION: Final Rule.

SUMMARY: This notice adopts amendments to Safety Standard No. 108 to allow motor vehicles including motorcycles to be equipped with Type A and Type E headlamps with a simplified mounting system intended to improve the incidence of correct headlamp aim. The headlamps are designated Type G and Type H. The retaining ring and mounting ring assembly used to hold the headlamp in place are eliminated. The new mounting system incorporates integral mounting/aiming tabs on the body of the headlamp and permits the headlamp to attach directly to the aiming screws, and thus the car body.

DATE: Effective date of the amendment is November 12, 1986.

SUPPLEMENTARY INFORMATION: On December 20, 1984, Chrysler Corporation petitioned the National Highway Traffic Safety Administration for rulemaking to amend 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* to allow the use of a new mounting system it had developed for plastic headlamps. According to Chrysler, its new system reduces vehicle weight, is less costly, and simplifies headlamp aim and replacement. The headlamps and their mounting system continue to meet all applicable performance requirements of Standard No. 108, including vibration, corrosion, and photometrics. The agency granted Chrysler's petition, and on March 25, 1986, published a *Notice of Proposed Rulemaking* (51 FR 10237).

Until 1983, headlamp systems specified by Standard No. 108, consisted of sealed beam headlamps, rings for mounting and aiming purposes, and rings for retaining the headlamps. At that time Standard No. 108 was amended to permit the replaceable bulb headlamp in which the size and shape are left to the manufacturer's design and thereby vary significantly from that of traditional sealed beam lamps. Attendant with this styling freedom was the freedom to mount the lamps in whatever manner the designer chose though continuing to meet aim performance requirements. The method that has evolved is the placement of mounting tabs and ball joints on the rear of the reflector area. These integral mounting tabs attach to the screws and pivots which are the headlamp's aim adjustment mechanism, and the traditional metal mounting and retaining rings are eliminated.

Chrysler's petition expands the use of such integral mounting/aiming systems from replaceable bulb headlamps to two types of sealed beam headlamps. As the *Notice of Proposed Rulemaking* observed, the new mounting system, which Chrysler calls the "Integral Mount Sealed Beam Headlamp System" eliminates the traditional metal retaining ring and metal mounting ring assembly used to hold a sealed beam headlamp in the vehicle. This simplified mounting system incorporates integral mounting/aiming tabs on the body of the sealed beam headlamp and permits the headlamp to attach directly to the aiming screws, and thus the car body. Chrysler wishes to introduce this integral mounting system on headlamps which are physically and functionally similar to the Type A, the four lamp, small rectangular, headlamp system, and the Type E, the two lamp, small rectangular headlamp system. Because the mounting system would be an integral part of the headlamp, the headlamps so manufactured would not be interchangeable with Type A or Type E sealed beam headlamps. Therefore, Type A and Type E headlamp systems incorporating such an integral mount would be considered a "new" system and would need a designation to differentiate them from standard Type A and Type E systems. Accordingly, Chrysler suggested Type G and Type H as the new designations.

The two major changes to the standard desired by Chrysler deal with the dimensional aspects of sealed beam headlamp design related to interchangeability features and the lamp system nomenclature. Chrysler suggested permitting vehicles to be equipped with two Type 1G1 and two Type 2G1, or two Type 2H1 headlamps, designed to conform to the dimensional requirements and the applicable performance requirements normally required of existing sealed beam headlamps and headlamp systems.

Chrysler attributed the following benefits to the simplified mounting system:

- Weight savings of one half pound per headlamp over existing plastic sealed beam headlamp systems. This will enhance fuel economy.
- Simplified headlamp replacement; only two screws (instead of four) required to remove the lamp and install its replacement.
- Lamp reaim upon replacement is unnecessary if the aiming screws are not disturbed. Chrysler claims that, because it has specified a certain close relationship between the aiming pads and the mounting tabs/mounting ball, lamp aim will be unaffected by replacement.
- Simplified aiming process because fewer adjustments are necessary for proper aim than current aiming systems. Chrysler also claims that headlamp aiming, when re-aiming is necessary, will be performed better, faster and more willingly.

In support of some of those claims. Chrysler provided pertinent data. For example, to demonstrate the improvement in aimability, Chrysler performed an aim deviation test where integral mount lamp assemblies were exercised through the full range of aim adjustment, vertically or horizontally. Chrysler found that the mean vertical aim deviation with the integral mount system was 32 percent of that of the standard Chrysler headlamp mounting system and 14 percent of the mean deviation in the horizontal axis.

Chrysler specified a close relationship in the aiming and mounting planes so that replacement lamps will achieve essentially the same aim as the originals. The petitioner offered data which show the variability in aim when standard sealed beam lamps are replaced, and when integral mount sealed beam lamps are replaced. The standard lamps had a mean aim deviation of 1.262 inces horizontal and 3.374 inches vertical. The integral mount lamps had a mean aim deviation of 0.799 inch horizontal and 0.879 inch vertical. This shows a replacement aim error improvement of 31 percent horizontal and 74 percent vertical for the samples tested. Based on the results, Chrysler argued that the new system can be replaced without reaim. This is in distinct contrast to most existing sealed beam lamps which often require reaim upon replacement.

To assure that proper interchangeability occurs with sealed beam headlamps incorporating the integral mounting system, Chrysler submitted drawings which prescribe the necessary interchangeability dimensions and features (proposed as Figures 17 and 18). These figures also require that the nearly-identical Type 2G1 and the 1G1, be designed with a different spacing on the mounting tabs to assure non-interchangeability since one is a lower beam lamp and the other is an upper.

Additionally, Chrysler stated that the new headlamp systems will be designed to conform to all applicable tests as met by existing sealed beam lamps. This would include lamp retention, torque deflection, aim adjustment, inward force, connector tests, and photometry tests.

After review of the new mounting system, NHTSA tentatively concluded that it offers the potential for improved headlamp aim at the time of the vehicle's manufacture with the possibility of no further reaim during the life of the vehicle, even upon headlamp replacement. This would provide an enhancement of motor vehicle safety, though the benefits cannot be quantified. To achieve these benefits, when the lamp systems go into production, they must achieve the same level of aim performance that the prototypes achieved. If production tolerances closely approximate those of the prototypes, the system will be likely to remain properly aimed over the vehicle's life, and fulfill Chrysler's expectations for it.

Therefore, NHTSA proposed on March 25, 1986, amendments of the nature Chrysler requested, however, the system would be a modification of all Type A and Type E headlamps and not just those with plastic lenses. NHTSA also proposed that Type G and Type H be available for use on motorcycles, though benefits for that application are less clear.

Seven comments were received on the proposal. The new headlamps and mounting system were endorsed by Ford Motor Company, Chrysler, GE, and Volkswagen of America. Ford and Chrysler suggested a clarification of the torque deflection test to specify that a second reading on the thumb wheel shall be taken. The agency concurs, and the rule adopts this suggestion. General Electric stated that the consumer's best interests are not necessarily served by the action, because it is unlikely that retail automotive parts outlets will stock presumably low-demand Type G and Type H headlamps. While this may be true, the new headlamps should be available from the parts departments of all dealers who sell vehicles equipped with the new headlamps, and the consumer's search for a replacement lamp need not compromise safety. Corning also opposed the new system for the same reason. Stanley Electric Co., and Koito also raised the issue of proliferation. Both Koito Electric Co. and Stanley objected to the proposal because it covers a design of a proprietary nature, and that its use, at least in the United States, should be on a royalty-free basis. After reviewing these comments, Chrysler filed a statement in the docket on June 10, 1986, that "all manufacturers of motor vehicles, headlamps or headlamp components" wishing to manufacture or use the new system "will be granted royalty-free non-exclusive licenses to use the mounting system upon request, under U.S. patents and U.S. patent applications . . . to the extent that use of the mounting system is necessary to employ the proposed optional headlamp system on motor vehicles regulated by the U.S. Motor Vehicle Safety Standards." NHTSA has therefore decided to adopt the rule as proposed.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures. The economic impact is expected to be minimal and therefore, a regulatory evaluation has not been prepared. Since use of the headlamps is optional, the rule will not impose additional requirements or costs but will permit manufacturers greater flexibility in use of headlighting systems.

Because this amendment relieves a restriction and because of the necessity of vehicle, headlamp, and bulb manufacturers to plan production and distribution on an orderly basis, the agency finds that an immediate effective date is in the public interest.

In consideration of the foregoing, 49 CFR 571.108 Motor Vehicle Safety Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment* is amended as follows:

1. In paragraph S4.1.1.34 the following are added to the chart of headlighting types.

System	Headlamp Type	Number of Headlamps
*	*	*
7	Type 1G1 and Type 2G1	1 lamp each
8	Type 2H1	1 lamp

2. New paragraphs S4.1.1.47 and S4.1.1.48 are added to read:

S4.1.1.47 Instead of being equipped with a headlamp system specified in Table I and Table III, a passenger car, multipurpose passenger vehicle, truck, or bus manufactured on or after September 1, 1986, may be equipped with a Type G headlamp system consisting of two type 1G1 and two type 2G1 headlamps or a Type H headlamp system consisting of two type 2H1 headlamps that are designed to conform to the following requirements:

(a) The dimensions specified in Figures 21 and 22.

(b) The requirements of SAE Standard J579c, *Sealed Beam Headlamp Units for Motor Vehicles,* December 1978.

(c) The requirements of SAE Standard J580 August 1979, *Sealed Beam Headlamp Assembly,* with the following exceptions:

(1) Sections 2.2, 2.3, 4, 6.3 and 6.5

(2) In place of Sections 6.3 and 6.5, the following requirements shall be met:

(i) *Retention Test.* The sealed beam unit shall remain held securely in its design position after 20 replacements.

(ii) *Torque Deflection Test.* The headlamp assembly to be tested shall be mounted in the designed vehicle position and set at nominal aim (0.0). A special adaptor (Figure 18) for the deflectometer of Figure 3 shall be clamped onto the headlamp assembly. A torque of 20 lb.-in. (2.25 N-m) shall be applied to the headlamp assembly through the deflectometer, and a reading on the thumb wheel shall be taken. The torque shall be removed and a second reading on the thumb wheel shall be taken. The difference between the two readings shall not exceed 0.30 degree.

S4.1.1.48 The lens of each headlamp designed to conform with paragraph S4.1.1.47 shall be marked with the symbol "DOT" (either horizontally or vertically) which shall constitute certification that the headlamp conforms to applicable Federal motor vehicle safety standards, and with one of the following designations as appropriate:

(a) A lens for a headlamp, nominal size 100 x 165mm, incorporating an upper beam only and meeting the upper beam performance requirement of SAE J579c December 1978, Table 2, Upper Beam, shall be labeled 1G1.

(b) A lens for a headlamp, nominal size 100 x 165 mm, incorporating both an upper beam and a lower beam meeting the performance requirements of SAE J579c December 1978, Table 2 Upper Beam and Lower Beam shall be labelled 2G1.

(c) A lens for a headlamp, nominal size 100 x 165 mm, incorporating both an upper beam and a lower beam meeting the performance requirements of SAE J579c December 1978, Table 1 shall be labelled 2H1.

3. Figures 18, 21, and 22 are added as follows:

Issued on November 4, 1986.

Diane K. Steed
Administrator

51 F.R. 40979
November 12, 1986

MOTOR VEHICLE SAFETY STANDARD NO. 108

Lamps, Reflective Devices, and Associated Equipment—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, Trailers, and Motorcycles

(Docket No. 69-18)

S1. Purpose and scope. This standard specifies requirements for original and replacement lamps, reflective devices, and associated equipment necessary for signaling and for the safe operation of motor vehicles during darkness and other conditions of reduced visibility.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers (except pole trailers and trailer converter dollies), and motorcycles, and to lamps, reflective devices, and associated equipment for replacement of like equipment on vehicles to which this standard applies.

S3. Definitions. "Aiming Reference Plane" means a plane which is perpendicular to the longitudinal axis of the vehicle and tangent to the forwardmost aiming pad on the headlamp.

"Flash" means a cycle of activation and deactivation of a lamp by automatic means, continuing until stopped either automatically or manually.

"Headlamp test fixture" means a device designed to support a replaceable bulb headlamp in the test position specified in the laboratory tests in S4.1.1.36.(d), and whose mounting hardware and components are those necessary to operate the headlamp as installed in a motor vehicle.

"Replaceable bulb headlamp" means a headlamp comprising a bonded lens and reflector assembly and one or two standardized replaceable light sources.

"Seasoning" means a process of energizing the filament of a headlamp, at design voltage, for a period of time equal to 1 percent of average rated laboratory life.

[“Standardized replaceable light source" means n assembly of a capsule, base, and terminals, that meets the requirements of S4.1.1.39. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986)]**

"Type 1" means a headlamp, with only an upper beam filament, whose identification code begins with the numeral "1."

"Type 2" means a headlamp, with both upper and lower beam filaments, whose identification code begins with the numeral "2."

S4. Requirements.

S4.1 Required motor-vehicle lighting equipment.

S4.1.1. Except as provided in succeeding paragraphs of S4.1.1., each vehicle shall be equipped with at least the number of lamps, reflective devices, and associated equipment specified in Tables I and III, as applicable. Required equipment shall be designed to conform to the SAE Standards or Recommended Practices referenced in those tables. Table I applies to multipurpose passenger vehicles, trucks, trailers, and buses, 80 or more inches in overall width. Table III applies to passenger cars and motorcycles and to multipurpose passenger vehicles, trucks, trailers, and buses less than 80 inches in overall width.

S4.1.1.1. A truck tractor need not be equipped with turn-signal lamps mounted on the rear if the turn signal lamps at or near the front are so constructed (double-faced) and so located that they meet the requirements for double-faced turn signals specified in SAE Standard J588e, *Turn Signal Lamps,* September 1970.

S4.1.1.2. A truck tractor need not be equipped with any rear side-marker devices, rear clearance lamps, and rear identification lamps.

S4.1.1.3. Intermediate side-marker devices are not required on vehicles less than 30 feet in overall length.

S4.1.1.4. Reflective material conforming to Federal Specification L-S-300, *Sheeting and*

Tape, Reflective; Non-exposed Lens, Adhesive Backing, September 7, 1965, may be used for side reflex reflectors if this material, as used on the vehicle, meets the performance standards in either Table I or Table IA of SAE Standard J594f, *Reflex Reflectors,* January 1977.

Test points (deg)		*Turn signal*	*Stop*	*Parking*	*Tail*
10U, 10D	5L, 5R	20	20	20	20
5U, 5D	20L, 20R	12.5	12.5	10	15
	10L, 10R	37.5	37.5	20	40
	V	87.5	87.5	70	90
H	10L, 10R	50	50	35	40
	5L, 5R	100	100	90	100
	V	100	100	100	100

FIGURE 1a.—Required percentages of minimum candlepower of Figure 1b.

Minimum design candlepower requirements are determined by multiplying the percentage given in this Figure by the minimum allowable candlepower values in Figure 1b. The resulting values shall be truncated after one digit to the right of the decimal point.

S4.1.1.5 The turn-signal operating unit on each passenger car and multipurpose passenger vehicle, truck, and bus less than 80 inches in overall width, manufactured on or after January 1, 1973, shall be self-cancelling by steering wheel rotation and capable of cancellation by a manually operated control.

S4.1.1.6. [Each stop lamp manufactured to replace a stop lamp that was designed to conform to SAE Standard J586b *Stop Lamps,* June 1966, may also be designed to conform to J586b. **(51 F.R. 28238—August 6, 1986. Effective: August 6, 1986.)**] It shall meet the photometric minimum candlepower requirements for Class A red turn-signal lamps specified in SAE Standard J575d, *Tests for Motor Vehicle Lighting Devices and Components,* August 1967. Each such lamp [manufactured for use] on a passenger car and on a multipurpose passenger vehicle, truck, trailer, or bus less than 80 inches in overall width shall have an effective projected luminous area not less than 3½ square inches. If multiple compartment lamps or multiple lamps are used, the effective projected luminous area of each compartment or lamp shall be not less than 3½ square inches; however, the photometric requirements may be met by a combination of compartments or lamps.

S4.1.1.7. [Each turn signal lamp manufactured to replace a turn signal lamp that was designed to conform to SAE Standard J588d *Turn Signal Lamps,* June 1966, may also be designed to conform to J588d. **(51 F.R. 28238—August 6, 1987. Effective: August 6, 1986.)**] Each such lamp [manufactured for use] on a passenger car and on a multipurpose passenger vehicle, truck, trailer or bus less than 80 inches in overall width shall have an effective projected luminous area not less than 3½ square inches. If multiple compartment lamps or multiple lamps are used, the effective projected luminous area of each compartment or lamp shall be not less than 3½ square inches; however, the photometric requirements may be met by a combination of compartments or lamps. Each such lamp [manufactured for use] on a multipurpose passenger vehicle, truck, trailer or bus 80 inches or more in overall width shall have an effective projected luminous area not less than 12 square inches.

S4.1.1.8. For each motor vehicle less than 30 feet in overall length, the photometric-minimum candlepower requirements for side marker lamps specified in SAE Standard J592e, *Clearance, Side Marker, and Identification Lamps,* July 1972, may be met for all inboard test points at a distance of 15 feet from the vehicle and on a vertical plane that is perpendicular to the longitudinal axis of the vehicle and located midway between the front and rear side-marker lamps.

S4.1.1.9. Boat trailers need not be equipped with both front and rear clearance lamps, provided an amber (to front) and red (to rear) clearance lamp is located at or near the midpoint on each side of the trailer so as to indicate its extreme width.

S4.1.1.10. Multiple license-plate lamps and backup lamps may be used to fulfill the requirements of the SAE Standards applicable to such lamps referenced in Tables I and III.

S4.1.1.11. A parking lamp, taillamp, stop lamp, or turn-signal lamp shall meet the minimum percentage specified in Figure 1a of the corresponding minimum allowable value specified in Figure 1b. The maximum candlepower output of each stop, turn signal, tail and parking lamp shall not exceed that prescribed in Figure 1b. [The values specified in Figure 1a and Figure 1b are substituted for those specified in Table I of the following SAE Standards: J222 *Parking Lamps,* J585e *Taillamps* (maximum at H or above), J585c *Stop Lamps,* and J588e *Turn Signal Lamps,* except that motorcycle turn signal lamps need meet only one-half of the minimum photometric values specified in Figure 1b. **(50 F.R. 23813—June 6, 1985. Effective: June 6, 1985)]**

Lamp	*Lighted Sections*		
	1	*2*	*3*
Stop	80/300	95/360	110/420
Tail[1]	2/18	3.5/20	5.0/25
Parking[2]	4.0/125	......	......
Red turn signal	80/300	95/360	110/420
Yellow turn signal rear	130/750	150/900	175/1050
Yellow turn signal front	220/ -	240/ -	275/ -
Yellow turn signal front[3]	500/ -	600/ -	685/ -

FIGURE 1b.—Minimum and maximum allowable candlepower values.

[1] Maximum at H or above.

[2] The maximum candlepower value of 125 applies to all test points at H or above. The maximum allowable candlepower value below H is 250.

[3] Values apply when the optical axis (filament center) of the front-turn signal is at a spacing less than 4 inches (10 cm.) from the lighted edge of the headlamp unit providing the lower beam, or from the lighted edge of any additional lamp installed as original equipment or used in lieu of the lower beam.

S4.1.1.12. A parking lamp, taillamp, stop lamp, or turn-signal lamp is not required to meet the minimum photometric value at each test point specified in this standard if the sum of the percentage of the minimum candlepower measured at the test points is not less than that specified for each group listed in Figure 1c.

Groups and test points	*Turn signal*	*Stop*	*Parking*	*Tail*
10U–5L, 5U–20L, 5D–20L, 10D–5L	65	65	60	70
5U–10L, H–10L, 5D–10L	125	125	75	120
H–5L, 5U–V, H–V, 5D–V, H–5R	475	475	420	480
5U–10R, H–10R, 5D–10R	125	125	75	120
10U–5R, 5U–20R, 5D–20R, 10D–5R	65	65	60	70

FIGURE 1c.—Sum of the percentages of grouped minimum candlepower.

S4.1.1.13. Instead of headlamps designed to conform to the requirements of Table I and Table III, a passenger car, multipurpose passenger vehicle, truck, or bus may be equipped with two white headlamps that are designed to conform to:

(a) the requirements of SAE Standard J571d, *Dimensional Specifications for Sealed Beam Headlamp Units,* June 1976, that apply to Type 2A sealed beam headlamp units, except that the designation "2A" shall not appear on the lens, and the ground terminal shall be rotated clockwise 45 degrees; and

(b) the requirements of SAE Standard J579c, *Sealed Beam Headlamp Units for Motor Vehicles,* December [1978], and subreferenced standards, that apply to Type 2 headlamp units;

(c) SAE Standard J580b, *Sealed Beam Headlamp Assembly,* February 1974.

S4.1.1.14. The lens of each headlamp that conforms with paragraph S4.1.1.13 shall be marked with the symbol "DOT" (printed horizontally) or "DOT" (printed vertically) which shall constitute a certification that the headlamp conforms to all applicable Federal motor vehicle safety standards, and shall be labeled 2E1.

S4.1.1.15. At a voltage of 12.8 volts, the maximum design wattage for the upper and lower beams of each Type 2E1 headlamp shall be 70 watts for the upper beam and 60 watts for the lower beam.

S4.1.1.16. All passenger cars and multipurpose passenger vehicles, trucks, and buses of less than 80 inches overall width shall be equipped with turn signal operating units designed to complete a durability test of 100,000 cycles.

S4.1.1.17. A trailer that is less than 30 inches in overall width may be equipped with only one of each of the following lamps and reflective devices, located at or near its vertical centerline: Taillamp, stoplamp, and rear reflex reflector.

S4.1.1.18. A trailer that is less than 6 feet in overall length, including the trailer tongue, need not be equipped with front side-marker lamps and front side reflex reflectors.

S4.1.1.19. A lamp designed to use a type of bulb that has not been assigned a mean spherical candlepower rating by its manufacturer and is not listed in SAE Standard J573d, *Lamp Bulbs and Sealed Units,* December 1968, shall meet the applicable requirements of this standard when used with any bulb of the type specified by the lamp manufacturer, operated at the bulb's design voltage. A lamp that contains a sealed-in bulb shall meet these requirements with the bulb operated at the bulb's design voltage.

S4.1.1.20. Except for a lamp having a sealed-in bulb, a lamp shall meet the applicable requirements of this standard when tested with a bulb whose filament is positioned within ±.010 inch of the nominal design position specified in SAE Standard J573d, *Lamp Bulbs and Sealed Units,* December 1968, or specified by the bulb manufacturer.

S4.1.1.21. The lens of each headlamp designed to conform to SAE Standard J579c, *Sealed Beam Headlamp Units for Motor Vehicles,* December 1978, shall be marked with the symbol

"D
"DOT" or O
T"

which shall constitute a certification that the headlamp conforms to applicable Federal motor vehicle safety standards, and with one of the following designations, as appropriate:

(a) A lens for rectangular headlamp (100 × 165 mm) incorporating an upper beam only, shall be labeled 1A1.

(b) A lens for a rectangular headlamp (100 × 165 mm), incorporating both an upper beam and a lower beam shall be labeled 2A1.

(c) A lens for a rectangular headlamp (142 × 200 mm), incorporating both an upper beam and a lower beam, shall be labeled 2B1.

(d) A lens for a circular headlamp (146-mm diameter), incorporating an upper beam only, shall be labeled 1C1.

(e) A lens for a circular headlamp (146-mm diameter), incorporating both an upper and a lower beam shall be labeled 2C1.

(f) A lens for a circular headlamp (178-mm diameter), incorporating both an upper beam and a lower beam, shall be labeled 2D1.

S4.1.1.22. A backup lamp is not required to meet the minimum photometric values at each test point specified in Table I of SAE Standard J593c, *Backup Lamps* [February 1986] if the sum of the candlepower measured at the test points within each group listed in Figure 2 is not less than the group totals specified in that figure.

S4.1.1.23. Variable-load turn-signal flashers shall comply with voltage-drop and durability requirements with the maximum design load connected and shall comply with starting-time, flash rate, and percent current "on" time requirements both with the minimum and with the maximum design load connected.

S4.1.1.24. The lowest voltage drop for turn-signal flashers and hazard warning-signal flashers measured between the input and load terminals, shall not exceed 0.8 volt.

S4.1.1.25. The dimensional specifications for headlamp-unit retaining rings of Figures 2(B), 5(B), and 8(B) of SAE Standard J571d, *Dimensional Specifications for Sealed Beam Headlamp Units,* June 1976, and of Figure 2(B), SAE Recommended Practice J1132 *142 mm×200 mm Sealed Beam Headlamp Unit,* January 1976, do not apply.

S4.1.1.26. A motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn-signal lamps.

S4.1.1.27. A motor-driven cycle whose speed attainable in 1 mile is 30 mph or less may be equipped with a stop lamp whose effective projected luminous lens area is not less than 3½ square inches and whose photometric output for the groups of test points specified in Figure 1 is at least one-half of the minimum values set forth in that figure.

S4.1.1.28. [Each taillamp manufacutred to replace a taillamp designed to conform to SAE Standard J585d *Tail Lamps,* August 1970, may also be designed to conform to J585d. **(51 F.R. 28238—August 6, 1986. Effective: August 6, 1986).]**

Group	*Test point, degrees*	*Total for Group, cd (see notes a, b)*
1[a]	45L–5U	45
	45L–H	
	45L–5D	
2[a]	30L–H	50
	30L–5–D	
3	10L–10U	100
	10L–5U	
	V–10U	
	V–5U	
	10R–10U	
	10R–5U	
4	10L–H	360
	10L–5D	
	V–H	
	V–5D	
	10R–H	
	10R–5D	
5[a]	30R–H	50
	30R–5D	
6[a]	45R–5U	45
	45R–H	
	45R–5D	

FIGURE 2—Minimum luminous intensity requirements for backup lamps

[a] When two lamps of the same or symmetrically opposite design are used, the reading along the vertical axis and the averages of the readings for the same angles left and right of vertical for one lamp shall be used to determine compliance with the requirements. If two lamps of differing designs are used, they shall be tested individually and the values added to determine that the combined units meet twice the candela requirements.

[b] When only one backup lamp is used on the vehicle, it shall be tested to twice the candela requirements.

S4.1.1.29. Each turn signal lamp manufactured to replace a turn signal lamp (on a motorcycle) that was designed to conform to SAE Standard J588d, *Turn Signal Lamps,* June 1966, may also be designed to conform to J588d.

S4.1.1.30. Deleted 50 F.R. 23813. June 6, 1985.

S4.1.1.31. Each turn signal lamp on a motorcycle manufactured on and after January 1, 1973, shall have an effective projected luminous area not less than 3½ square inches.

S4.1.1.32. Note 6 of Table 1 in SAE Standard J588e, *Turn Signal Lamps,* September 1970, does not apply. A stoplamp that is not optically combined with a turn signal lamp shall remain activated when the turn-signal is flashing.

S4.1.1.33. At a voltage of 12.8 volts, the maximum design wattage for upper and lower beams on headlamps designed to conform to SAE Standard J579c, *Sealed Beam Headlamp Units for Motor Vehicles,* December [1978], shall be as follows: 55 watts for upper beam on Type 1A1 and Type 1C1, 43 watts for upper beam and 65 watts for lower beam on Type 2A1 and Type 2C1, 70 watts for upper beam and 60 watts for lower beam on Type 2B1, 65 watts for upper beam and 55 watts for lower beam on Type 2D1.

S4.1.1.34. A motorcycle may be equipped with one of the following headlighting systems:

System	Headlamp type	Number of headlamps
1	Type 1C1 or Type 1 (5¾ in.)	1 lamp
	and either	
	Type 2C1 or Type 2 (5¾ in.)	1 lamp
2	Type 2D1 or Type 1 (7 in.)	1 or 2 lamps
3	Type 1A1 or Type 1A	1 lamp
	and either	
	Type 2A1 or Type 2A	1 lamp
4	Type 2B1 or Type 2B	1 or 2 lamps
5	Type 2E1	1 lamp
6	Type UF	1
	and	
	Type LF	1
[7	Type 1G1 and Type 2G1	1 lamp each
8	Type 2H1	1 lamp

(51 F.R. 40979—November 12, 1986. Effective: November 12, 1986)]

S4.1.1.35. Each headlamp manufactured to replace a headlamp designed to conform to SAE Standard J580a, *Sealed Beam Headlamp,* June 1966, may also be designed to conform to J580a.

S4.1.1.36. Instead of being equipped with a headlighting system specified in Table I or Table III, a motor vehicle manufactured on or after July 1, 1983, may be equipped with a system of one or two replaceable bulb headlamps, if the vehicle is a motorcycle, or two or four replaceable bulb headlamps, if the vehicle is a passenger car, multipurpose passenger vehicle, truck, or bus. Each replaceable bulb headlamp shall be designed to conform to the following requirements.

(a) (1) Each replaceable bulb headlamp shall include components which are designed to conform to the applicable specifications of paragraphs S4.1.1.37, S4.1.1.38 and S4.1.1.39.

[(2) The lens of each replaceable bulb headlamp shall have three pads which meet the requirements of Figure 4, *Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units,* **(51 F.R. 24152—July 2, 1986. Effective: July 2, 1986)]**

Except as provided in subparagraph (a)(3), a whole number, which represents the distance in tenths of an inch (i.e., 0.3 inch. = 3) from the aiming reference plane to the respective aiming pads which are not in contact with that plane, shall be inscribed adjacent to each respective aiming pad on the lens. The height of these numbers shall be not less than .157 inch (4mm). If there is interference between the plane and the area of the lens between the aiming pads, the whole number will represent the distance to a secondary plane. The secondary plane shall be located parallel to the aiming reference plane and as close to the lens as possible without causing interference.

(3) If the most forward aiming pad is the lower inboard aiming pad, then the dimensions may be placed anywhere on the lens. The dimension for the outboard aiming pad (Dimension F in Figure 4) shall be followed by the letter "H" and the dimension for the center aiming pad shall be followed by the letter "V". The dimensions shall be expressed in tenths of an inch.

(b) Each replaceable bulb headlamp shall be designed to conform to the following sections of the specified SAE Standards and Recommended Practices with any standardized replaceable light source intended for use in such headlamp.

(1) Section 4.6—Photometry of SAE J575, JUN 80 *Tests for Motor Vehicle Lighting Devices and Components.*

(2) Section 3.1—*Test Voltage and Section 3.5—Photometric Design Requirements,* excluding Tables 1 and 2 for headlamps equipped with Type HB3, Type HB4, Types HB1 and HB3, or Types HB1 and HB4, and excluding Table 2 of SAE J579c *Sealed Beam Headlamp Units for Motor Vehicles* December 1978 for headlamps in systems with only Type HB1. The term "aiming plane" in paragraph 3.5 of SAE J579c shall mean "aiming reference plane."

(3) Section 5—*General Requirements,* Section 6—*Design Requirements and Tests* (to the extent listed below), Section 6.1—*Aiming Adjustment Test,* Section 6.2—*Inward Force Test,* and Section 6.4—*Connector Tests of SAE J580, AUG 79 Sealed Beam Headlamp Assembly.*

(c) A headlamp with a glass lens need not meet the following tests of the sections specified: abrasion resistance (S6.2), chemical resistance (S6.4), and impact (S6.9). If, in addition to a glass lens, the headlamp uses a non-plastic reflector, it need not meet the internal heat test of section S6.7.2.

(d) When tested according to any of the procedures indicated in subparagraphs (1) through (8), a replaceable-bulb headlamp shall meet the appropriate requirement:

(1) After an abrasion test conducted in accordance with S6.2, the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(2) After a vibration test conducted in accordance with S6.3, there shall be no evidence of loose or broken parts visible without magnification, except that the filament need not be unbroken.

(3) After a chemical-resistance test involving exposure to any of the fluids listed in S6.4, there shall be no surface deterioration, coating delamination, fractures, deterioration of bonding materials, color bleeding or color pickup visible without magnification, and the headlamp shall meet the photometric requirements applicable to the headlamp system under test.

(4) After a corrosion test conducted in accordance with S6.5, there shall be no evidence of external or internal corrosion or rust visible without magnification. Loss of adhesion of any applied coating shall not occur more than .125 inch (3.2 mm) from any sharp edge on the inside or outside. Corrosion may occur on terminals only if the current produced during the test of Paragraph S6.5(c) is not less than 9.7 amperes.

(5) After a dust test conducted in accordance with S6.6, the headlamp shall meet the photometric requirements.

(6) The headlamp shall first meet the requirements of paragraph (d) (6) (A) and then those of paragraph (d) (6) (B).

(A) After a temperature-cycle test conducted in accordance with S6.7.1, the headlamp shall show no evidence of delamination, fractures, entry of moisture or deterioration of bonding material, color bleeding, warpage or deformation visible without magnification, or lens warpage greater than .118 inch (3 mm) when measured perpendicular to the aiming plane at the point of intersection of the axis of each replaceable light source with the exterior surface of the lens, and it shall meet the photometric requirements [applicable to the headlamp system under test. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

(B) After an internal heat test conducted in accordance with S6.7.2, there shall be no lens warpage greater than .118 inch (3 mm) when measured perpendicular to the aiming plane at the point of intersection of the axis of each replaceable light source with the exterior surface of the lens, and it shall meet the photometric requirements [applicable to the headlamp system under test. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

(7) After a humidity test conducted in accordance with S6.8, the inside of the headlamp shall show no evidence of delamination or moisture, fogging or condensation visible without magnification, and the headlamp shall meet the photometric requirements [applicable to the headlamp system under test. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

(8) After an impact on a headlamp with a plastic lens, conducted in accordance with S6.9, there shall not be any fracture of the adhesion of lens coating or delamination of materials visible without magnification, and the lens shall not be broken, cracked, or chipped.

[(e) For a headlamp equipped with one or two Type HB1 light sources the following requirements apply. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

(1) There shall be no mechanism that allows adjustment of an individual standardized replaceable light source or adjustment of reflector aim on a headlamp with two standardized replaceable light sources.

(2) Lower beam photometrics shall be provided by a filament designed with an average life of 320 hours.

(3) The lower and upper beams of a headlamp system consisting of two lamps, each containing two standardized replaceable light sources, shall be provided as follows:

(i) The lower beam shall be produced in one of the following ways:

(A) By the outboard light source (or the upper one if arranged vertically), designed to conform to the lower beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978; or

(B) By both light sources, designed to conform to the lower beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source, (or the lower one if arranged vertically) designed to conform to the upper beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 978; or

(B) By both light sources, designed to conform to the upper beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978.

(iii) Each such headlamp manufactured as replacement motor vehicle equipment shall be designed to meet the requirements of paragraphs (e)(3)(i) and (e)(3)(ii) of this section.

(4) The lower and upper beams of a headlamp system consisting of four lamps, each containing a single standardized replaceable light source, shall be provided as follows:

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978. The lens of each such headlamp shall be permanently marked with the letter "L".

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Table I of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978. The lens of each such headlamp shall be permanently marked with the letter "U".

(iii) Each such headlamp manufactured as replacement motor vehicle equipment shall be designed to meet the requirements of paragraphs (e)(4)(i) and (e)(4)(ii) of this section.

[(f) For headlamp systems equipped with Type HB3 and HB4, HB1 and HB3, or HB1 and HB4 light sources, the following requirements apply.

(1) There shall be no mechanism that allows adjustment of an individual light source, or adjustment of reflector aim on a headlamp with two light sources.

(2) Lower beam photometrics shall be provided by filaments with a minimum average design life of not less than 320 hours.

(3) The lower and upper beams of a headlamp system consisting of two lamps, each containing two light sources (type HB3 and HB4, or type HB1 with HB3 or HB4) shall be provided only as follows:

(i) The lower beam shall be produced in one of the following ways:

(A) By the outboard light source (or the uppermost if arranged vertically) or single light source, designed to conform to the lower beam requirements of Figure 17: or,

(B) By both light sources, designed to conform to the lower beam requirements of Figure 17.

(ii) The upper beam shall be provided in one of the following ways:

(A) By the inboard light source (or the lower one if arranged vertically) or single light source, designed to conform to the upper beam requirements of Figure 17; or

(B) By both light sources, designed to conform to the upper beam requirements of Figure 17.

(4) The lower and upper beams of a headlamp system consisting of four lamps, using HB3 and HB4, HB1 and HB3, or HB1 and HB4 light sources, each containing only a single light source, shall be provided only as follows:

(i) The lower beam shall be produced by the outboard lamp (or upper one if arranged vertically), designed to conform to the lower beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "L".

(ii) The upper beam shall be produced by the inboard lamp (or lower one if arranged vertically), designed to conform to the upper beam requirements of Figure 15. The lens of each such headlamp shall be permanently marked with the letter "U".

(5) For replaceable bulb headlamps, a +/−¼ degree reaim tolerance is permitted for the test points of Figures 15 and 17. The test point 10U-90U shall be measured from the normally exposed surface of the lens face. **(51 F.R. 16325—May 2, 1986) Effective: June 2, 1986)]**

S4.1.1.37. [Each lens-reflector unit manufactured as replacement equipment for a replaceable bulb headlamp system shall be designed to conform to the requirements of S4.1.1.36 when any standardized replaceable light source is inserted in it. **(51 F.R. 16325—May 2, 1986. Effective June 2, 1986)]**

[**S4.1.1.38** The lens of each replaceable bulb headlamp and the base of each standardized replaceable light source shall be marked as follows:

(a) With the symbol "DOT" horizontally or vertically which shall constitute certification that the headlamp or light source conforms to all applicable Federal motor vehicle safety standards.

(b) The base of each Type HB3 and HB4 light source shall also be marked by its manufacturer or importer with its HB Type Designation and the name or trademark registered with the U.S. Patent Office of the manufacturer and importer (if applicable).

(c) The lens of each replaceable bulb headlamp using HB3 or HB4 light sources, or HB1 light sources in conjunction with HB3 or HB4 light sources within a headlamp system on a motor vehicle shall permanently display the Type Designation(s) for that standardized replaceable light source on the lens in front of each light source. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986)]**

[**S4.1.1.39** Each standardized replaceable light source shall be designed to conform to the following requirements:

(a) A type HB1 light source shall be designed to conform to the dimensions specified in Figure 3 and shall incorporate a silicone O-ring. A Type HB3 light source shall be designed to conform to the dimensions specified in Figure 19. A Type HB4 light source shall be designed to conform to the dimensions specified in Figure 20.

(b) Each standardized replaceable light source shall be designed to conform to the following general specifications:

Specification	Lower beam	Upper beam
Maximum power, watts		
HB1...........	50	70
HB3...........	---	70
HB4...........	60	---
Luminous flux, lumens:		
HB1...........	700±15%	1200±15%
HB3...........	---	1700±12%
HB4...........	1000±15%	---
Minimum average design life, hours: all.......	320	150

(c) The standardized replaceable light source filament(s) shall be subject to seasoning before measurement of maximum power and luminous flux.

(d) Measurement of maximum power and luminous flux shall be made with the direct current test voltage regulated within one-quarter of one percent. The test voltage shall be design voltage, 12.8v. The measurement of luminous flux for the HB1 shall be in accordance with the Illuminating Engineering Society of North America, LM-45: *IES Approved Method for Electrical and Photometric Measurements of General Service Incandescent Filament Lamps* (April 1980), shall be made with the black cap installed on HB1 and HB4, and shall be made with the electrical connector and light source base shrouded with an opaque white colored cover, except for the portion normally located within the interior of the lamp housing. The measurement of luminous flux for the HB3 and HB4 shall be with the base covered with a white cover shown in Figures 19-1 and 20-1. The white covers are used to eliminate the likelihood of incorrect lumen measurement that will occur should the reflectance of the light source base and electrical connector be low.

(e) Measurement of minimum average design life shall be made at 14.0v for all light sources. Testing is conducted in a completed headlamp assembly, or equivalent, placed in the attitude in which the assembly is to be installed on a motor vehicle.

(f) The capusule, lead wires and/or terminals on each Type HB1, Type HB3 and Type HB4 light source shall be installed in the base so as to provide an airtight seal. Such a seal exists on Type HB3 and Type HB4 when no air bubbles shall appear on the low pressure (connector) side after the light source has been immersed in water for one minute while inserted in a cylindrical aperture of 0.796 ± 0.004 in. (20.22 ± 0.10mm) (Type HB3) or 0.875 ± 0.004 in. (22.22 ± 0.1 mm) (Type HB4) and subjected to a minimum air pressure of 69kPa (10 P.S.I.G. on the glass capsule side.

(g) After the force deflection test conducted in accordance with S7, the permanent deflection of the glass envelope shall not exceed 0.005 in. (0.13 mm) in the direction of the applied force.

(h) A general tolerance shall apply to Figure 3 as follows: ± 0.004 in (0.10 mm) to all linear dimensions and +/- 1°0′ to all angular dimensions except for referenced dimensions and unless otherwise specified. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986).]**

S4.1.1.40. Reserved.

S4.1.1.41. Each passenger car manufactured on or after September 1, 1985, shall be equipped with a high-mounted stoplamp which:

(a) Shall have an effective projected luminous area not less than 4½ square inches.

(b) Shall have a signal visible to the rear through a horizontal angle from 45 degrees to the left to 45 degrees to the right of the longitudinal axis of the vehicle.

(c) Shall have the minimum photometric values in the amount and location listed in Figure 10, instead of those in Table 1 of SAE Recommended Practice J186a, *Supplemental High Mounted Stop and Rear Turn Signal Lamps,* September 1977.

(d) Need not meet the requirements of paragraphs 3.1.6 Moisture Test, 3.1.7 Dust Test, and 3.1.8 Corrosion Test of SAE Recommended Practice J186a if it is mounted inside the vehicle.

(e) Shall provide access for convenient replacement of the bulb without the use of special tools.

S4.1.1.42. A passenger car manufactured between August 1, 1984 and September 1, 1985, may be equipped with a high-mounted stop lamp that conforms to S4.3.1.8.

S4.1.1.43. Instead of being equipped with a headlighting system specified in Table I or Table III, a passenger car, multipurpose passenger vehicle, truck or bus manufactured on or after July 1, 1985, may be equipped with a headlighting system of two Type UF and two Type LF headlamps designed to conform to:

(a) The dimensions specified in Figures 11, 12, 13, and 14.

(b) The photometric requirements of Figure 15. A reaim tolerance of ± ¼ degree is allowed for any test point on the Type LF lamp when tested alone, and such a tolerance is not allowed for the Type UF lamp when tested alone. For the test point 10U-90U, measurement shall be from the normally exposed surface of the lens face.

(c) The requirements of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* December 1978, with the following exceptions:

(1) The definitions in Sections 2.4 through 2.11 do not apply:

(2) In Section 2.12, the definition of "Mechanically Aimable Sealed Beam Unit" is: "A unit having three pads, defining a mechanical aiming plane, used to adjust and inspect the aim of the unit when installed on the vehicle."

(3) In Section 2.13, the definition of "Aiming Plane" is: "A plane defined by the three aiming pads."

(4) Section 3.4 does not apply.

(5) Tables 1 and 2, and Figures 1 and 2 do not apply.

(6) In Sections 3.5.1 and 3.5.3, references to "Tables 1 and 2" and Figure 3 are replaced by "Figure 15."

(7) Section 3.6 does not apply.

(d) When tested in accordance with Section 3.5.2 of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* December 1978, the mounted assembly (either Type UF or Type LF headlamps, respective mounting ring, aiming ring, and aim adjustment mechanism) shall be designed to conform to meet the requirements of Figure 15 for upper or lower beams respectively without reaim when any conforming Type UF or LF headlamp is tested and replaced by another conforming headlamp of similar type.

(e) The requirements of SAE Standard J580, August 1979, *Sealed Beam Headlamp Assembly,* with the following exceptions:

(1) Section 2.2 *Mounting Ring* reads: "The adjustable ring upon which the sealed beam unit is mounted and which forces the sealed beam unit to seat against the aiming ring when assembled into a sealed beam headlamp assembly."

(2) Section 2.3 *Aiming Ring* reads: "The clamping ring that retains the sealed beam unit against the mounting ring, and that provides an interface between the unit's aiming/seating pads and the headlamp aimer adapter (locating plate)."

(3) In Section 3, the correct version of SAE J575 is "SAE 575f (April 1975)."

(4) Section 4 does not apply.

(5) Section 5.1 reads: "Headlamps shall be designed so that they may be inspected and aimed by mechanical aimers as specified in SAE J602 [October 1980 *Headlamp Aiming Device for Mechanically Aimable Sealed Beam Headlamp Units*] without the removal of any ornamental trim rings or other parts."

(6) Section 6.1.1 reads: "When the headlamp assembly is tested in the laboratory, a minimum aiming adjustment of ±2.5 deg. shall be provided in the horizontal plane and ±4 deg. in the vertical plane."

(7) Section 6.1.2 reads: ". . . through an angle of *±2.5 deg. and* ±4 deg., respectively."

(8) Section 6.3 is retitled *Retaining Ring/Aiming Ring Tests.*

(9) In Section 6.3.2 add the flange thickness "92×150 mm . . . . 0.340 in. 8.6 mm)."

(10) Figures 2, 3, and 4 do not apply, and the reference to them in Section 6.5 is replaced by "Figure 16, Deflectometer, of Federal Motor Vehicle Safety Standard No. 108."

S4.1.1.44. The lens of each headlamp designed to conform to paragraph S4.1.1.43 shall be marked with:

(a) The designation "UF" if it provides an upper beam, or "LF" if it provides a lower beam; and

(b) The symbol "DOT" (either horizontally or vertically) which shall constitute a certification that the headlamp conforms to all applicable Federal motor vehicle safety standards.

S4.1.1.45. Each headlamp designed to conform to paragraph S4.1.1.43 shall also be designed to conform to the following specifications:

	Type LF	Type UF
Watts @ 12.8 V (design voltage)	60 max.	70 max.
Average Life @ 14.0 V (rated voltage)	320 hr.	150 hr.

S4.1.1.46. Type F headlamps may be mounted on common or parallel seating and aiming planes to permit simultaneous aiming of both headlamps provided that or when tested with any conforming Type UF and LF headlamps according to paragraph S8, (a) the assembly (consisting of the Type UF and LF headlamps, mounting rings, the aiming/seating rings, and aim adjustment mechanism), shall be designed to conform to the test point values of Figure 15. (b) There shall be no provision for adjustment between the common or parallel aiming and seating planes of the two lamps.

[S4.1.1.47 Instead of being equipped with a headlamp system specified in Table I and Table III, a passenger car, multipurpose passenger vehicle, truck, or bus manufactured on or after September 1, 1986, may be equipped with a Type G headlamp system consisting of two type 1G1 and two type 2G1 headlamps or a Type H headlamp system consisting of two type 2H1 headlamps that are designed to conform to the following requirements:

(a) The dimensions specified in Figures 21 and 22.

(b) The requirements of SAE Standard J579c, *Sealed Beam Headlamp Units for Motor Vehicles,* December 1978.

(c) The requirements of SAE Standard J580 AUG 1979, *Sealed Beam Headlamp Assembly,* with the following exceptions:

(1) Sections 2.2, 2.3, 4, 6.3 and 6.5

(2) In place of Sections 6.3 and 6.5, the following requirements shall be met:

(i) *Retention Test.* The sealed beam unit shall remain securly in its design position after 20 replacements.

(ii) *Torque Deflection Test.* The headlamp assembly to be tested shall be mounted in the designed vehicle position and set at nominal aim (0.0). A special adaptor (Figure 18) for the deflectometer of Figure 3 shall be clamped onto the headlamp assembly through the deflectometer, and a reading on the thumb wheel shall be taken. The torque shall be removed and a second reading on the thumb wheel shall be taken. The difference between the two readings shall not exceed 0.30 degree. **(F.R. 40979—November 12, 1986. Effective: November 12, 1986)]**

[S4.1.1.48 The lens of each headlamp designed to conform with paragraph S4.1.1.47 shall be marked with the symbol "DOT" (either horizontally or vertically) which shall constitute certification that the headlamp conforms to applicable Federal motor vehicle safety standards, and with one of the following designations as appropriate:

(a) A lens for a headlamp, nominal size 100 x 165 mm, incorporating an upper beam only and meeting the upper beam performance requirement of SAE J579c December 1978, Table 2, Upper Beam, shall be labeled 1G1.

(b) A lens for a headlamp, nominal size 100 x 165 mm, incorporating both an upper beam and a lower beam meeting the performance requirements of SAE J579c December 1978, Table 2 Upper beam and Lower Beam shall be labelled 2G1.

(c) A lens for a headlamp, nominal size 100 x 165 mm, incorporating both an upper beam and a lower beam meeting the performance requirements of SAE J579c December 1978, Table 1 shall be labelled 2H1. **(51 F.R. 40979—November 12, 1986. Effective: November 12, 1986.)**

S4.1.2. Plastic materials used for optical parts such as lenses and reflectors shall conform to SAE *Recommended Practice* J576c, May 1970, except that:

(a) Plastic lenses used for inner lenses or those covered by another material and not exposed directly to sunlight shall meet the requirements of paragraphs 3.4 and 4.2 of SAE J576c, when covered by the outer lens or other material;

(b) After the outdoor-exposure test, the haze and loss of surface luster of plastic materials used for lamp lenses shall not be greater than 30 percent haze as measured by ASTM-1003-61, *Haze* and Luminous Transmittance of Transparent Plastics; and

(c) After the outdoor-exposure test, plastic materials used for reflex reflectors shall meet the appearance requirements of paragraph 4.2.2 of SAE J576c.

S4.1.3. No additional lamp, reflective device, or other motor vehicle equipment shall be installed that impairs the effectiveness of lighting equipment required by this standard.

S4.1.4. Each school bus shall be equipped with a system of either:

(a) Four red signal lamps designed to conform to SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, and installed in accordance with that standard; or

(b) Four red signal lamps designed to conform to SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, and four amber signal lamps designed to conform to that standard, except for their color, and except that their candlepower shall be at least 2½ times that specified for red signal lamps. Both red and amber lamps shall be installed in accordance with SAE Standard J887, except that:

(i) Each amber signal lamp shall be located near each red signal lamp, at the same level, but closer to the vertical centerline of the bus; and

(ii) The system shall be wired so that the amber signal lamps are activated only by manual or foot operation, and if activated, are automatically deactivated and the red signal lamps automatically activated when the bus entrance door is opened.

S4.1.5. The color in all lamps, reflective devices, and associated equipment to which this standard applies shall comply with SAE Standard J578c, *Color Specification for Electric Signal Lighting Devices,* February 1977.

S4.2. Other requirements.

S4.2.1. The words "it is recommended that," "recommendations," or "should be" appearing in any SAE Standard or Recommended Practice referenced or subreferenced in this standard shall be read as setting forth mandatory requirements, except that the aiming pads on the lens face and the black area surrounding the signal lamp, recommended in SAE Standard J887, *School Bus Red Signal Lamps,* July 1964, are not required.

S4.2.2. The words "Type 1 (5¾__)," "Type 2 (5¾__)," "Type 2 (7__)," "Type 1A," "Type 2A," and "Type 2B" appearing in any SAE Standard or Recommended Practice referenced or subreferenced in this standard shall also be read as setting forth requirements respectively for the following types of headlamps: 1C1, 2C1, 2D1, 1A1, 2A1, and 2B1.

S4.3. Location of required equipment.

S4.3.1. Except as provided in succeeding paragraphs of S4.3.1, each lamp, reflective device, and item of associated equipment shall be securely mounted on a rigid part of the vehicle other than glazing that is not designed to be removed except for repair, in accordance with the requirements of Tables I or III and in locations specified in Table II (multipurpose passenger vehicles, trucks, trailers, and buses 80 or more inches in overall width) and Table IV (all passenger cars, and motorcycles, and multipurpose passenger vehicles, trucks, trailers, and buses less than 80 inches in overall width), as applicable.

S4.3.1.1. Except as provided in S4.3.1.1.1, each lamp and reflective device shall be located so that it meets the visibility requirements specified in any applicable SAE Standard or Recommended Practice. In addition, no part of the vehicle shall prevent a parking lamp, taillamp, stoplamp, turn-signal lamp, or backup lamp from meeting its photometric output

S4.3.1.1.1. Clearance lamps may be mounted at a location other than on the front and rear if necessary to indicate the overall width of a vehicle, or for protection from damage during normal operation of the vehicle, and at such a location they need not be visible at 45 degrees inboard.

S4.3.1.2. On a truck tractor, the red rear reflex reflectors may be mounted on the back of the cab, at a minimum height not less than 4 inches above the height of the rear tires.

S4.3.1.3. On a trailer, the amber front side reflex reflectors and amber front side-marker lamps may be located as far forward as practicable exclusive of the trailer tongue.

S4.3.1.4. When the rear identification lamps are mounted at the extreme height of a vehicle, rear clearance lamps need not meet the requirement of Table II that they be located as close as practicable to the top of the vehicle.

S4.3.1.5. The center of the lens referred to in SAE Standard J593c, *Backup Lamps,* February 1968, is the optical center.

S4.3.1.6. On a truck tractor, clearance lamps mounted on the cab may be located to indicate the width of the cab, rather than the overall width of the vehicle.

S4.3.1.7. The requirement that there be not less than 4 inches between a front turn-signal lamp and a low-beam headlamp, specified in SAE Standard J588e, *Turn Signal Lamps,* September 1970, shall not apply if the sum of the candlepower values of the turn-signal lamp measured at the test points within each group listed in Figure 1c is not less than two and one-half times the sum specified for each group for yellow turn-signal lamps.

S4.3.1.8. Each high-mounted stoplamp on a passenger car manufactured on or after September 1, 1985, shall be mounted with its center on the vertical centerline of the passenger car as the car is viewed from the rear. The lamp may be mounted at any position on the centerline, including the glazing. If the lamp is mounted inside the vehicle, means shall be provided to minimize reflections from the light of the lamp upon the rear window glazing that might be visible to the driver when viewed directly, or indirectly in the rearview mirror. If the lamp is mounted below the rear window, no portion of the lens shall be lower than 6 inches below the rear window on convertibles, or 3 inches on other passenger cars.

S4.4. Equipment combinations.

S4.4.1. Deleted 51 F.R. 28238. August 6, 1986.

S4.5. Special wiring requirements.

S4.5.1. Each vehicle shall have a means of switching between lower and upper headlamp beams that conforms to SAE Recommended Practice J564a, *Headlamp Beam Switching,* April 1964, or to SAE Recommended Practice J565b, *Semi-Automatic Headlamp Beam Switching Devices,* February 1969.

S4.5.2. Each vehicle shall have a means for indicating to the driver when the upper beams of the headlamps are on that conforms to SAE Recommended Practice J564a, April 1964, except that the signal color need not be red.

S4.5.3. The taillamps on each vehicle shall be activated when the headlamps are activated in a steady-burning state.

S4.5.4. The stoplamps on each vehicle shall be activated upon application of the service brakes. The high-mounted stoplamp on each passenger car shall be activated only upon application of the service brakes.

S4.5.5. The vehicular-hazard warning-signal operating unit on each vehicle shall operate independently of the ignition or equivalent switch, and when activated, shall cause to flash simultaneously sufficient turn-signal lamps to meet, as a minimum, the turn-signal lamp photometric requirements of this standard.

S4.5.6. Each vehicle equipped with a turn-signal operating unit shall also have an illuminated pilot indicator. Failure of one or more turn-signal lamps to operate shall be indicated in accordance with SAE Standard J588e, *Turn Signal Lamps,* September 1970, except where a variable-load turn-signal flasher is used on a truck, bus, or multipurpose passenger vehicle 80 or more inches in overall width, on a truck that is capable of accommodating a slide-in camper, or on any vehicle equipped to tow trailers.

S4.5.7. On all passenger cars, and motorcycles, and multipurpose passenger vehicles, trucks, and buses of less than 80 inches overall width:

(a) When the parking lamps are activated, the taillamps, license plate lamps, and side-marker lamps shall also be activated; and

(b) When the headlamps are activated in a steady-burning state, the taillamps, parking lamps, license plate lamps and side-marker lamps shall also be activated.

S4.5.8. The lower and upper beams of a headlamp system consisting of four lamps, each containing a single standardized replaceable light source, shall not be activated simultaneously, except momentarily for temporary signaling use. [On a motor vehicle equipped with a headlighting system comprising four replaceable bulb headlamps designed to conform to the photometry of Figure 15, the lamps marked "L" may be wired to remain permanently activated when the lamps marked "U" are activated. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

S4.5.9. [The wiring harness or connector assembly of a replaceable bulb headlamp with two identical standardized replaceable light sources or a four-lamp replaceable bulb headlamp system which uses identical light sources in all four lamps shall be designed so that the filaments not intended to be used with the lens prescription in front of such filament shall not be illuminated. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

S4.5.10. The filaments in a dual-filament standardized replaceable light source shall not be activated simultaneously except momentarily when switching between beams, or for temporary signaling use.

S4.5.11. The wiring requirements for lighting equipment in use are:

(a) Turn signal lamps, hazard warning signal lamps, and school bus warning lamps shall be wired to flash;

(b) High-mounted stop lamps, on passenger cars manufactured on or after August 1, 1984, but before September 1, 1986, may flash when the hazard warning system is activated;

(c) Headlamps and side-marker lamps may be wired to flash for signalling purposes;

(d) A motorcycle headlamp may be wired to allow either its upper beam or its lower beam, but not both, to modulate from a higher intensity to a lower intensity in accordance with Section S4.6;

(e) All other lamps shall be wired to be steady-burning.

S4.5.12. On a motor vehicle equipped with a Type F headlighting system, the lower beam headlamps (Type LF) may be wired to remain permanently activated when the upper beam headlamps (Type UF) are activated.

S4.6. Motorcycle headlamp modulation system.

S4.6.1. A headlamp on a motorcycle may be wired to modulate either the upper beam or the lower beam from its maximum intensity to a lesser intensity provided that:

(a) The rate of modulation shall be 240 ± 40 cycles per minute.

(b) The headlamp shall be operated at maximum power for 50 to 70 percent of each cycle.

(c) The lowest intensity at any test point shall be not less than 17 percent of the maximum intensity measured at the same point.

(d) The modulator switch shall be wired in the power lead of the beam filament being modulated and not in the ground side of the circuit.

(e) Means shall be provided so that both the lower beam and upper beam remain operable in the event of a modulator failure.

(f) The system shall include a sensor mounted with the axis of its sensing element perpendicular to a horizontal plane. Headlamp modulation shall cease whenever the level of light emitted by a tungsten filament light operating at 3000° Kelvin is either less than 270 lux (25 footcandles) of direct light for upward pointing sensors or less than 60 lux (5.6 footcandles) of reflected light for downward pointing sensors. The light is measured by a silicon cell type light meter that is located at the sensor and pointing in the same direction as the sensor. A Kodak Gray Card (Kodak R-27) is placed at ground level to simulate the road surface in testing downward-pointing sensors.

(g) When tested in accordance with the test profile shown in Figure 9, the voltage drop across the modulator when the lamp is on at all test conditions for 12-volt systems and 6-volt systems shall not be greater than .45 volt. The modulator shall meet all the provisions of the standard after completion of the test profile shown in Figure 9.

(h) Means shall be provided so that both the lower and upper beam function at design voltage when the headlamp beam control switch is in either the lower or upper beam position when the modulator is off.

S4.6.2. (a) Each motorcycle headlamp modulator not intended as original equipment, or its container, shall be labelled with the maximum wattage, and the minimum wattage, appropriate for its use. Additionally, each such modulator shall comply with S4.6.1 (a) through (g) when connected to a headlamp of the maximum rated power and a headlamp of the minimum rated power and shall provide means so that the modulated beam functions at design voltage when the modulator is off.

(b) Instructions, with a diagram, shall be provided for mounting the light sensor including location on the motorcycle, distance above the road surface, and orientation with respect to the light.

S4.7. Replacement equipment.

S4.7.1. Each lamp, reflective device, or item of associated equipment manufactured to replace any lamp, reflective device, or item of associated equipment on any vehicle to which this standard applies, shall be designed to conform with this standard.

S4.7.2. Each lamp, reflective device, or item of associated equipment to which Section S4.7.1 applies may be labeled with the symbol DOT, which shall constitute a certification that it conforms to applicable Federal motor vehicle safety standards.

S5. Subreferenced SAE Standards and Recommended Practices.

S5.1. SAE Standards and Recommended Practices subreferenced by the SAE Standards and Recommended Practices included in Tables I and III and paragraphs S4.1.4 and S4.5.1 are those published in the 1970 edition of the SAE Handbook, except that the SAE standard referred to as "J575" is J575e, *Tests for Motor Vehicle Lighting Devices and Components,* August 1970, for stoplamps, taillamps, and turn-signal lamps designed to conform to SAE Standards J586c, J585d/J585e, and J588e, respectively, and for high-mounted stoplamps designed to conform to SAE Recommended Practice J186a.

The reference in J585e to J245 does not apply. The subreferenced Standards and Recommended Practices for headlamps designed to conform to SAE Standard J579c, *Sealed Beam Headlamp Units,* December 1978, are those published in the 1977 edition of the SAE Handbook.

S5.2. Requirements of SAE Standards incorporated by reference in this standard, other than J576b and J576c, do not include tests for warpage of devices with plastic lenses.

S6. Tests and procedures for replaceable-bulb headlamps. When tested according to the procedures below, each replaceable-bulb headlamp shall meet the requirements of S4.1.1.36.(b) and (d).

S6.1. Photometry. [A replaceable bulb headlamp shall be tested according to paragraph S3.5, Photometric Design Requirements, and Table 1 of SAE Standard J579c *Sealed Beam Headlamp Units for Motor Vehicles,* Dec. 1978, or by Figure 15 or 17 of Standard 108, as applicable, after the tests specified in S6.2, S6.4, S6.6, S6.7.1, S6.7.2 and S6.8. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)**]

S6.2. Abrasion. (a) A headlamp shall be mounted in the abrasion-test fixture in the manner indicated in Figure 5 with the lens facing upward.

(b) An abrading pad meeting the requirements in paragraph (c) (1) through (c) (4) of this section shall be cycled back and forth (1 cycle) for 11 cycles at 4 ± 0.8 in. (10 cm ± 2 cm) per second over at least 80 percent of the lens surface, including all the area between the upper and lower aiming pads, but not including lens covers and edges.

(c) (1) The abrading pad shall be not less than 1.0 ± .04 in. (2.5 cm ± .1 cm) wide, constructed of 0000 steel wool, and rubber cemented to a rigid base shaped to the same vertical contour of the lens. The "grain" of the pad shall be perpendicular to the direction of motion.

(2) The abrading-pad support shall be equal in size to the pad and the center of the support surface shall be within ± .08 in. (± 2 mm) of parallel to the lens surface.

(3) The density of the abrading pad shall be such that when the pad is mounted to its support and is resting unweighted on the lens, the base of the pad shall be no closer than .125 in. (3.2 mm) to the lens at its closest point.

(4) When mounted on its support and resting on the lens of the test headlamp, the abrading pad shall then be weighted such that a pad pressure of 2.0 ± .15 psi (14 ± 1 KPa) exists at the center and perpendicular to the face of the lens.

(d) A pivot shall be used if it is required to follow the contour of the lens.

(e) Unused steel wool shall be used for each test.

S6.3. Vibration. A vibration test shall be conducted according to the procedures in SAE Standard J575e, *Tests for Motor Vehicle Lighting Devices and Components,* August 1970, and those set forth in paragraphs (a) through (c) of this section.

(a) The table on the adapter plate is of sufficient size to contain completely the test-fixture base with no overhang.

(b) The direction of vibration is the vertical axis of the headlamp as mounted on the vehicle.

(c) The filament is cold (not energized).

S6.4. Chemical resistance. (a) The entire exterior lens surface of the fixtured headlamp and top surface of the lens-reflector joint shall be wiped once to the left and once to the right with a 6-inch-square soft cotton cloth (with pressure equally applied) which has been saturated once in a container with 2 ounces of one of the test fluids listed in paragraph (b) of this section. The lamp shall be wiped within 5 seconds after removal of the cloth from the test fluid.

(b) The test fluids are:

(1) gasoline—unleaded 89 octane $\frac{(R+M)}{2}$ or above used per OSHA Std. 29 CFR 1910–106—*Handling Storage and Use of Flammable Combustible Liquids.*

(2) tar remover (petroleum base with Xylene).

(3) power steering fluid.

(4) windshield washer fluid consisting of 0.5% monoethanolamine with the remainder 50% concentrations of methanol/distilled water by volume.

(5) antifreeze (50% concentration of ethylene glycol/distilled water by volume).

(c) After the headlamp has been wiped with the test fluid, it shall be stored in designed operating attitude for 48 hours at a temperature of 73°F ± 7° (23°C ± 4°) and a relative humidity of 30 ± 10 percent. At the end of the 48-hour period, the headlamp shall be wiped clean with a soft dry cotton cloth and visually inspected.

S6.5. Corrosion. (a) A connector test shall be performed on each filament circuit prior to the test in subparagraph (b) according to Figure 1 of SAE Standard J580, **[**AUG 79 *Sealed Beam Headlamp Assembly***]**. The power source shall be set to provide 12.8 volts and the resistance shall be set to produce 10 amperes.

(b) The headlamp with connector attached to the terminals, unfixtured and in its designed operating attitude with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be subjected to a salt spray (fog) test in accordance with ASTM B117–73, *Method of Salt Spray (FOG) Testing,* for a period of 240 hours, consisting of 10 successive 24-hour intervals. During each interval, the headlamp shall be mounted in the middle of the chamber and exposed for 23 hours to the salt spray. The spray shall not be activated for the 24th hour. The bulb shall be removed from the headlamp and from the test chamber during the one hour of salt spray deactivation and reinserted for the start of the next test cycle, at the end of the first and last three 23-hour periods of salt spray exposure, and at the end of any two of the fourth through seventh 23-hour periods of salt-spray exposure. The test chamber shall be closed at all times except for a maximum of two minutes which is allowed for removal or replacement of a bulb during each cycle. After the ten cycles, the lens reflector unit without the bulb shall be immersed in deionized water for five minutes, then secured and allowed to dry by natural convection only.

(c) Using the voltage, resistance and pretest setup of subparagraph (a), the current in each filament circuit shall be measured after the test conducted in subparagraph (b).

S6.6. Dust. The headlamp, mounted on a test fixture, with all drain holes, breathing devices or other designed openings in their normal operating positions, shall be positioned within a cubical box, with inside measurements of 35.4 in. (900 mm) on each side, or larger if required for adequate wall clearance, i.e., a distance of at least 5.9 in. (150 mm) between the headlamp and any wall of the box. The box shall contain 9.9 lb. (4.5 kg) of fine powdered cement which conforms to the ASTM C150–77 *Specification for Portland Cement.* Every 15 minutes, the cement shall be agitated by compressed air or fan blower(s) by projecting blasts of air for a 2-second period in a downward direction so that the cement is diffused as uniformly as possible throughout the entire box. This test shall be continued for 5 hours, after which the exterior surfaces of the headlamp shall be wiped clean.

S6.7. Temperature and internal heat tests. A headlamp with one or more standardized replaceable light sources shall be tested according to S6.7.1 and S6.7.2. Tests shall be made with all filaments lighted at design voltage that are intended to be used simultaneously in the headlamp and which in combination draw the highest total wattage. These include but are not limited to filaments used for turn signal lamps, fog lamps, parking lamps, and headlamp lower beams lighted with upper beams when the wiring harness is so connected on the vehicle. If a turn signal is included in the headlamp assembly, it shall be operated at 90 flashes a minute with a 75±2% current "on time". If the lamp produces both the upper and lower beam, it shall be tested in both the upper beam mode and the lower beam mode under the conditions above described, except for a headlamp with a single HB1 light source.

S6.7.1. Temperature cycle. A headlamp mounted on a headlamp test fixture shall be subjected to 10 complete consecutive cycles having the thermal cycle profile shown in Figure 6. During the hot cycle, the lamp shall be energized commencing at point "A" of Figure 6 and de-eneri̇gized at point "B." Separate or single test chambers may be used to generate the environment of Figure 6. All drain holes, breathing devices or other openings or vents of the headlamp shall be in their normal operating positions.

S6.7.2. Internal Heat Test. (a) The headlamp lens surface that would normally be exposed to road dirt shall be uniformly sprayed with any appropriate mixture of dust and water or other appropriate materials to reduce the photometric output at the H-V test point of the upper beam (or the ½D–1 ½R test point of the lower beam as appropriate) to 25±2% of the output originally measured in the photometric test performed under S4.1.1.36(b). A headlamp with a single HB1 light source shall be tested on the upper beam only. Such reduction shall be determined under the same conditions as that of the original photometric measurement.

(b) After the determination has been made that the photometric output of the lamp has been reduced as specified in S6.7.2(a), the lamp and its mounting hardware shall be mounted in an environmental chamber in a manner similar to that indicated in Figure 7, *Dirt/Ambient Test Setup.* The headlamp shall be soaked for one hour at a temperature of 95+7−0 degrees F (35+4−0 degrees C) and then the lamp shall be energized according to S6.7 for one hour in a still air condition, allowing the temperature to rise from the soak temperature.

(c) The lamp shall be returned to a room ambient temperature of 73+7−0 degrees F (23+4−0 degrees C) and a relative humidity of [30]±10% and allowed to stabilize to the room ambient temperature. The lens shall then be cleaned.

S6.8. Humidity. The headlamp mounted on a test fixture shall be placed in a controlled environment consisting of a temperature of 100+7−0 degrees F (38 +4−0 degrees C) with a relative humidity of not less than 90%. All drain holes, breathing devices, and other designed openings shall be in their normal operating positions. The headlamp shall be subjected to 20 consecutive 6-hour test cycles. In each cycle, it shall be energized at design voltage with the highest combination of filament wattages that are intended to be used, including a turn signal flashing at 90 flashes a minute with a 75±2% current "on-time, if so equipped, and then de-energized for 5 hours. After completion of the last cycle, the lamp shall be soaked for 1 hour at 73+7−0 degrees F [23]+4−0 degrees C) and relative humidity of [30]±10% before it is removed for photometric testing. The headlamp shall be tested for photometrics at 10±1 minute following completion of the humidity test.

S6.9. Impact. The headlamp shall be rigidly mounted in a headlamp test fixture on the seating lugs with the mechanical axis (bulb/socket axis) vertical, and the lens upward. The seating plane of the test fixture shall consist of oak wood 0.5 inch (13 mm) thick. One impact shall be delivered to the center of the lens on the mechanical axis, using a steel ball bearing with a diameter of .9055 in. (23 mm) weighing 1.76 oz. (50 gm), dropped freely from a distance of 15.75 in. (40 cm) from the bottom of the ball to the surface of the lens, at the intersection of the ball trajectory and the mechanical axis of the headlamp.

S7. Deflection test for standardized replaceable light sources. [(a) *Type HB1 light source.* With the light source rigidly mounted in a fixture in a manner indicated in Figure 8, apply a force of 4.0 ± 0.1 pounds (17.8 ± 0.4N) at a distance "A" from the reference plane perpendicular to the longitudinal axis of the glass capsule and parallel to the smallest dimension of the pressed glass capsule seal. The force application shall be applied using a rod with a hard rubber tip with a minimum spherical radius of 0.039 in (1 mm). The bulb deflection shall be measured at the glass capsule surface at 180 degrees opposite to the force application.

(b) *Type HB3 and HB4 light sources.* The deflection test is conducted according to paragraph (a), except that the force shall be applied radially to the surface of the glass capsule in four locations in a plane parallel to the reference plane and spaced at a distance "A" from that plane. These force applications shall be spaced 90 degrees apart starting at the point perpendicular to the smallest dimension of the pressed seal of the glass capsule. **(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986.)]**

S8. Photometry Test for Simultaneous Aim, Type F Headlamps. The assembly shall be located on a goniometer placed not less than 60 feet (18.3 m) from the photometer. The LF unit shall be aimed mechanically by centering the unit on the photometer axis and aligning the aiming plane of the lens perpendicular to the photometer axis. Then the assembly shall be moved in a plane parallel to the established aiming plane of the LF headlamp until the UF headlamp is centered on the photometer axis. Photometry measurements of the UF photometry unit shall be completed using the aiming plane so established. A reaim tolerance of ± ¼ degree is allowed for any test point.

35 F.R. 16842
October 31, 1970

TABLE I.—REQUIRED MOTOR VEHICLE LIGHTING EQUIPMENT—MULTIPURPOSE PASSENGER VEHICLES, TRUCKS, TRAILERS, AND BUSES, OF 80 OR MORE INCHES OVERALL WIDTH

Item Column 1	Multipurpose passenger vehicles, trucks and buses Column 2	Trailers Column 3	Applicable SAE standards or recommended practice * Column 4
Headlamps	2 white 7-inch Type 2 headlamp units; or 2 white 5¾-inch Type 1 headlamp units and 2 white 5¾-inch Type 2 headlamp units; or 2 white Type 2A headlamp units and 2 white Type 1A headlamp units.	None	J580a, June 1966; J579a, August 1965, J571d, June 1976 and J566, January 1960.
	2 white headlamps: Type 2B1 or Type 2D1; or 4 white headlamps: 2 each Type 1C1 and Type 2C1, or Type 1A1 and Type 2A1.		[J580, August 1979] J579c, December [1978] J571d, June 1976; J1132, January 1976
Taillamps [2]	2 red	2 red	J585e, September 1977
Stoplamps [2]	2 red	2 red	J586c, August 1970
License-plate lamp [1]	1 white	1 white	J587, October 1981
Reflex reflectors	4 red; 2 amber	4 red; 2 amber	J594f, January 1977
Side-marker lamps	4 red; 2 amber	2 red; 2 amber	J592e, July 1972
Backup lamp [1]	1 white	None	J593c, February 1968
Turn-signal lamps [2]	2 red or amber; 2 amber	2 red or amber.	J588e, September 1970
Turn signal operating unit. [3]	1	None	J589, April 1964
Turn-signal flasher	1	None	J590b, October 1965
Vehicular hazard-warning signal operating unit	1	None	J910, January 1966
Vehicular hazard warning signal flasher	1	None	J945, February 1966
Identification lamps	3 amber; 3 red	3 red	J592e, July 1972
Clearance lamps	2 amber; 2 red	2 amber; 2 red	J592e, July 1972
Intermediate side-marker lamps. [4]	2 amber	2 amber	J592e, July 1972
Intermediate side reflex reflectors [4]	2 amber	2 amber	J594f, January 1977

* See S5 for subreferenced SAE materials.

[1] See S4.1.1.10.

[2] See S4.1.1.11–12.

[3] See S4.5.6.

[4] See S4.1.1.3.

TABLE II.—LOCATION OF REQUIRED MOTOR VEHICLE LIGHTING EQUIPMENT MULTIPURPOSE PASSENGER VEHICLES, TRUCKS, TRAILERS, AND BUSES, OF 80 OR MORE INCHES OVERALL WIDTH

Item	Location on—		Height above road surface measured from center of item on vehicle at curb weight
Column 1	Multipurpose passenger vehicles, trucks, and buses Column 2	Trailers Column 3	Column 4
Headlamps	[On the front, each headlamp providing the upper beam, at the same height, 1 on each side of the vertical centerline, each headlamp providing the lower beam, at the same height, 1 on each side of the vertical centerline, as far apart as practicable. If a single standardized replaceable light sources is used to provide the lower beam in a headlamp with two standardized replaceable light sources, it shall be the farthest one from the vertical centerline.] *	Not required	Not less than 22 inches (55.9 cm) nor more than 54 inches (137.2 cm)
Taillamps	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	Not less than 15 inches, nor more than 72 inches
Stoplamps	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear, 1 on each side of the vertical centerline, at the same height, and as far apart as practicable	Not less than 15 inches, nor more than 72 inches
License-plate lamp.	At rear license plate, to illuminate the plate from the top or sides	At rear license plate to illuminate the plate from the top or sides	No requirement
Backup lamp	On the rear	Not required	No requirement
Turn-signal lamps.	At or near the front—1 amber on each side of the vertical centerline, at the same height, and as far apart as practicable. On the rear—1 red or amber on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear—1 red or amber on each side of the vertical centerline, at the same height, and as far apart as practicable	Not less than 15 inches, nor more than 83 inches
Identification lamps	On the front and rear—3 lamps, amber in front, red in rear, as close as practicable to the top of the vehicle, at the same height, as close as practicable to the vertical centerline, with lamp centers spaced not less than 6 inches or more than 12 inches apart. Alternatively, the front lamps may be located as close as practicable to the top of the cab.	(On the rear—3 lamps as close as practicable to the top of the vehicle at the same height, as close as practicable to the vertical centerline, with lamp centers spaced not less than 6 inches or more than 12 inches apart.)	On the front only—No part of the lamp or mountings shall extend below the top of the vehicle's windshield
Clearance lamps	On the front and rear—2 amber lamps on front, 2 red lamps on rear, to indicate the overall width of the vehicle, one on each side of the vertical centerline, at the same height, and as near the top as practicable	On the front and rear—2 amber lamps on front, 2 red lamps on rear, to indicate the overall width of the vehicle, one on each side of the vertical centerline, at the same height, and as near the top thereof as practicable	No requirement
Intermediate side marker lamps	On each side—1 amber lamp located at or near the midpoint between the front and rear side-marker lamps	On each side—1 amber lamp located at or near the midpoint between the front and rear side marker lamps	Not less than 15 inches
Intermediate side reflex reflectors	On each side—1 amber located at or near the midpoint between the front and rear side reflex reflectors	On each side—1 amber located at or near the midpoint between the front and rear side reflex reflectors	Not less than 15 inches nor more than 60 inches
Reflex reflectors	On the rear—1 red on each side of the vertical centerline, as far apart as practicable, and at the same height On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	On the rear—1 red on each side of the vertical centerline, as far apart as practicable, and at the same height On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	Not less than 15 inches nor more than 60 inches
Side marker lamps	On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	Not less than 15 inches, and on the rear of trailers not more than 60 inches

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* [(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986)]

TABLE III.—REQUIRED MOTOR VEHICLE LIGHTING EQUIPMENT ALL PASSENGER CARS AND MOTORCYCLES, AND MULTIPURPOSE PASSENGER VEHICLES, TRUCKS, TRAILERS, AND BUSES, OF LESS THAN 80 INCHES OVERALL WIDTH

Item Column 1	Passenger cars, multipurpose passenger vehicles, trucks, and buses Column 2	Trailers Column 3	Motorcycles Column 4	Applicable SAE standards or recommended practices * Column 5
Headlamps	2 white 7-inch Type 2 headlamp units; or 2 white 5¾-inch Type 1 headlamp units or 2 white 5¾-inch Type 2A headlamp units; and 2 white Type 1A headlamp units.			J580a, June 1966; J579a, August 1965, J571d, June 1976 and J566, January 1960
	2 white headlamps: Type 2B1 or Type 2D1; or 4 white headlamps: 2 each Type 1C1 and Type 2C1, or Type 1A1 and Type 2A1			[J580, August 1979] J579c, December [1978] J571d, June 1976; J1132, January 1976
			1 white	J584, April 1964 and J566, January 1960
Taillamps [2]	2 red	2 red	1 red	J585e, September 1977.
Stoplamps [2]	2 red	2 red	1 red	J586c, August 1970.
High-mounted stoplamp	1 red, for passenger cars only	Not required	Not required	J186a, September 1977
License-plate lamp [1]	1 white	1 white	1 white	J587, October 1981.
Parking lamps [2]	2 amber or white	None	None	J222, December 1970.
Reflex reflectors	4 red, 4 amber	4 red; 2 amber	3 red; 2 amber	J594f, January 1977.
Intermediate side reflex reflectors. [5]	2 amber	2 amber	None	J594f, January 1977.
Intermediate side-marker lamps. [5]	2 amber	2 amber	None	J592c, July 1972.
Side-marker lamps	2 red, 2 amber	2 red; 2 amber	None	J592e, July 1972.
Backup lamp	1 white	None	None	J593c, February 1968.
Turn-signal lamps [3]	2 red or amber; 2 amber.	2 red or amber.	2 amber; 2 red or amber.	J588, September 1970.
Turn-signal operating unit. [3] [4]	1	None	1	J589, April 1964.
Turn-signal flasher	1	None	1	J590b, October 1965.
Vehicular hazard-warning signal operating unit	1	None	None	J910, January 1966.
Vehicular hazard-warning signal flasher	1	None	None	J945, February 1966.

* See S5 or subreferenced SAE materials.

[1] See S4.1.1.10. [2] See S4.1.1.11–12. [3] See S4.5.6. [4] See S4.1.1.5. [5] See S4.1.1.3.

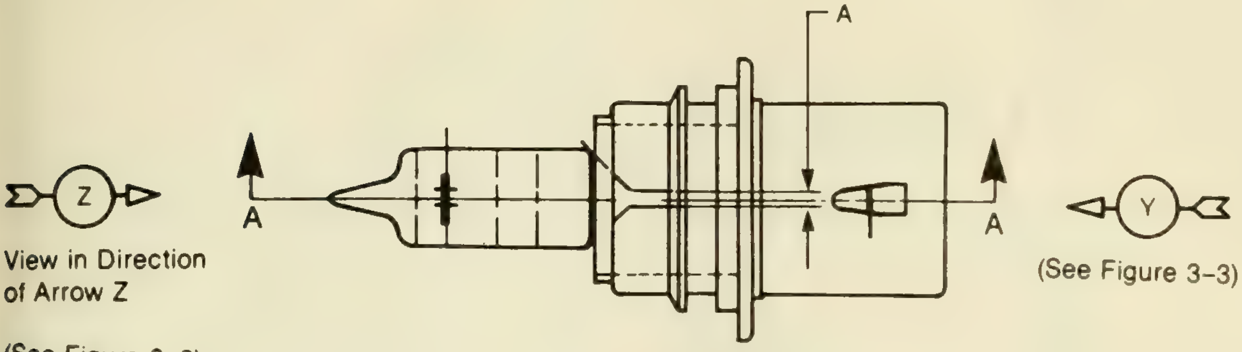
TABLE IV.—LOCATION OF REQUIRED EQUIPMENT— ALL PASSENGER CARS AND MOTORCYCLES, AND MULTIPURPOSE PASSENGER VEHICLES, TRUCKS, TRAILERS, AND BUSES, OF LESS THAN 80 INCHES OVERALL WIDTH

Item	Location on		Height above road surface measured from center of item on vehicle at curb weight
Column 1	Passenger cars, multipurpose passenger vehicles, trucks, trailers, and buses Column 2	Motorcycles Column 3	Column 4
Headlamps	[On the front, each headlamp providing the upper beam, at the same height, 1 on each side of the vertical centerline, each headlamp providing the lower beam, at the same height, 1 on each side of the vertical centerline, as far apart as practicable. If a single standardized replaceable light source is used to provide the lower beam in a headlamp with two standardized replaceable light sources, it shall be the farthest one from the vertical centerline.] *	On the front, on the vertical centerline, except that if two are used they shall be symmetrically disposed about the vertical centerline	Not less than 22 inches (55.9 cm) nor more than 54 inches (137.2 cm)
Taillamps	On the rear—1 on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear—on the vertical centerline except that if two are used, they shall be symmetrically disposed about the vertical centerline	Not less than 15 inches, nor more than 72 inches
Stoplamps	On the rear—1 on each side of the vertical centerline, at the same height, and as far apart as practicable	On the rear—on the vertical centerline except that if two are used, they shall be symmetrically disposed about the vertical centerline	Not less than 15 inches, nor more than 72 inches
High-mounted stoplamp	On the rear, on the vertical centerline [see S4.3.1.8], effective September 1, 1985, for passenger cars only.	Not required	[See S4.3.1.8]
License-plate lamp	At rear license plate, to illuminate the plate from the top or sides	At rear license plate	No requirement
Parking lamps	On the front—1 on each side of the vertical centerline, at the same height, and as far apart as practicable	Not required	Not less than 15 inches, nor more than 72 inches
Reflex reflectors	On the rear—1 red on each side of the vertical centerline, at the same height, and as far apart as practicable On each side—1 red as far to the rear as practicable and 1 amber as far to the front as practicable	On the rear—1 red on the vertical centerline except that if two are used on the rear, they shall be symmetrically disposed about the vertical centerline On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	Not less than 15 inches nor more than 60 inches
Backup lamp	On the rear	Not required	No requirement
Turn-signal lamps[1]	At or near the front—1 amber on each side of the vertical centerline, at the same height, and as far apart as practicable On the rear—1 red or amber on each side of the vertical centerline, at the same height, and as far apart as practicable	At or near the front—1 amber on each side of the vertical centerline, at the same height, and having a minimum horizontal separation distance centerline of lamps) of 16 inches; minimum edge-to-edge separation distance between lamp and headlamp is 4 inches At or near the rear—1 red or amber on each side of the vertical centerline, at the same height and having a minimum horizontal separation distance (centerline to centerline of lamps) of 9 inches; minimum edge-to-edge separation distance between lamp and tail or stoplamp is 4 inches	Not less than 15 inches, nor more than 83 inches
Side-marker lamps	On each side—1 red as far to the rear as practicable, and 1 amber as far to the front as practicable	Not required	Not less than 15 inches
Intermediate side-marker lamps	On each side—1 amber located at or near the midpoint between the front and rear side-marker lamps	Not required	Not less than 15 inches
Intermediate side-marker reflectors	On each side—1 amber located at or near the midpoint between the front and rear side marker reflectors	Not required	Not less than 15 inches, nor more than 60 inches

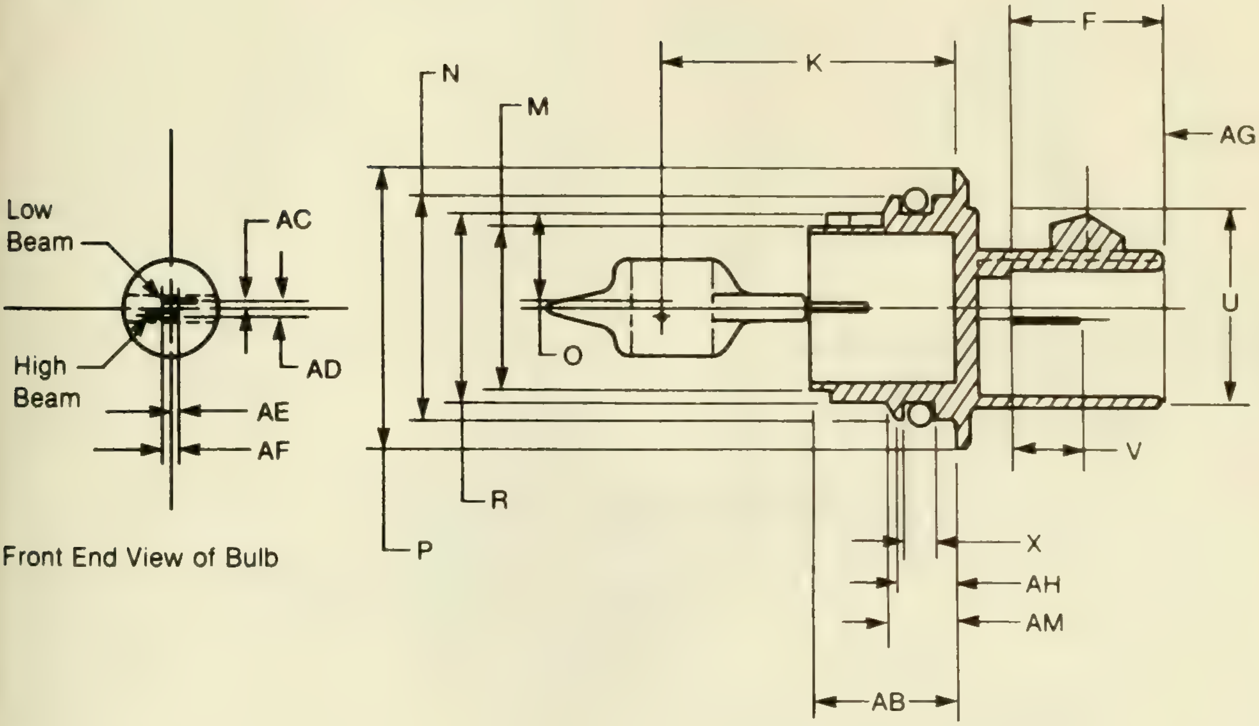
[1] Front turn-signal lamps not required for trailers.

* [(51 F.R. 16325—May 2, 1986. Effective: June 2, 1986)]

Figure 3: Specifications for the [Type HB 1] Standardized Replaceable Light Source



Plan View of Bulb



Front End View of Bulb

Side Sectional View of Bulb—(Section A)

Figure 3-1. Interchangeability Drawing of Headlamp Bulb Assembly

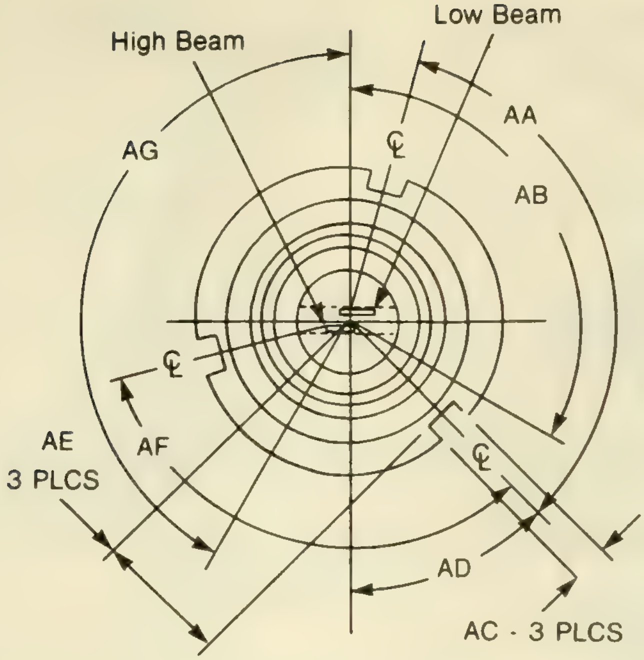
[Note: Unless otherwise specified, a general tolerance of ±004 in. (0.10mm) shall apply to all linear dimensions and ± 1% shall apply to all angular dimensions specified in Fig. 3 (48 F.R. 44815—September 30, 1983. Effective: September 30, 1983.)]

(See reverse page for dimensional specifications)

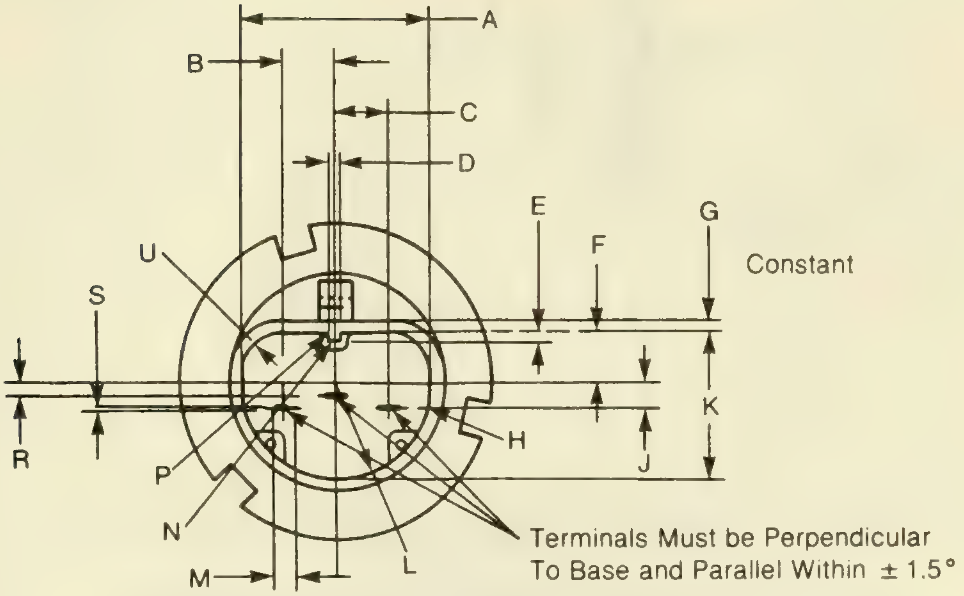
Dimension	Inches	Millimeters
A	.085 to .083 .002 either side CL	2.15 to 2.10 .05 either side CL
F	.906	23.00
H	.079	2.00
K: low beam	1.752 ± .015	44.50 ±0.38
high beam	CL high beam to be within ± 0.35 of CL of low beam	
M	.974	24.75
N	(1.335 to 1.331) .002 either side CL	(33.90) to (33.80) 0.05 either side CL
O	.517 ± .020	13.13 ± .050
P	1.673	42.50
R	(1.126 to 1.122) .002 either side CL	(28.60 to 28.50) .05 either side CL
U	1.181	30.00
V	.413	10.50
W	.128	3.25
X	.189	4.80
AC	.045 ± .020	1.15 ± .50
AD	.091 ± .028	2.30 ± .70
AE	.047 ± .020	1.20 ± .50
AF	.094 ± .032	2.40 ± .80
AH	.356	9.05
AM	.415	10.54
AN	.673	17.10

Note: These specifications effective November 3, 1986.

Figure 3-2. Dimensional Specifications for Figure 3-1



View Z—From Bulb End



Terminals Must be Perpendicular To Base and Parallel Within ± 1.5°

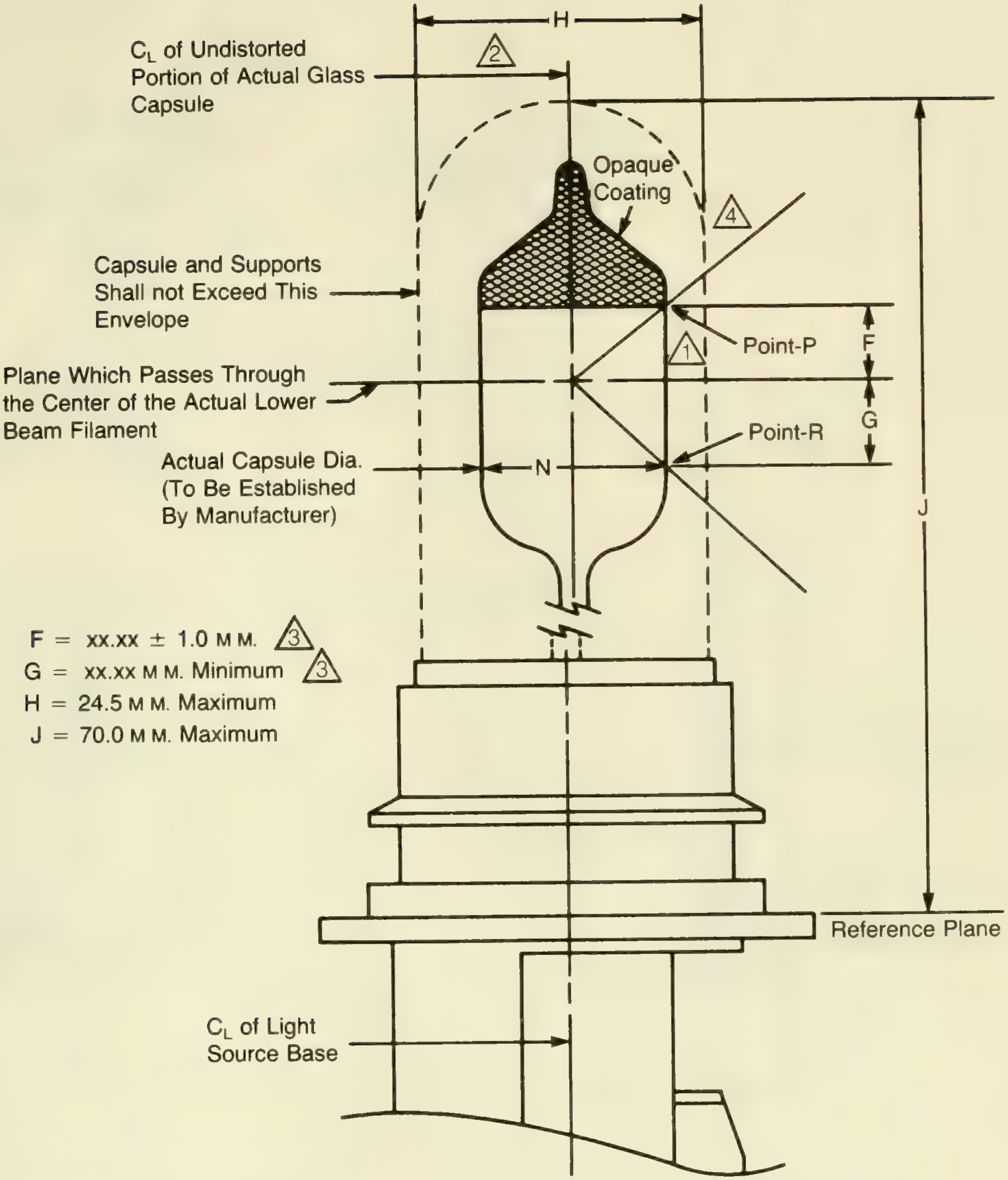
View Y—From Connector End

Figure 3-3. Bulb End and Connector End

(See reverse page for dimensional specifications)

Dimension	Inches	Millimeters
AA	120°	120°
AB	120°	120°
AC	.197	5.0
AD	44° 30°	44° 30°
AE	.722	18.35
AF	120°	120°
AG	150°	150°
AJ	.138	3.50
A	1.024	26.00
B	.289 ± .010	7.35 ± .25
C	.289 ± .010	7.35 ± .25
D	.055	1.40
E	.059	1.50
F	.278	7.05
G	.059	1.50
J	.142 ± .010	3.60 ± .25
K	.807	20.50
L	.531 R	13.50 R
M	.118	3.00
R	.075 ± .010	1.90 ± .25
S	.025 ± .002	.63 ± .25
U	.222 R	5.65 R

Figure 3-4. (Continued). Dimensional Specifications


H
2
C_L of Undistorted Portion of Actual Glass Capsule
Opaque Coating
4
Capsule and Supports Shall not Exceed This Envelope
Point-P
F
1
Plane Which Passes Through the Center of the Actual Lower Beam Filament
G
Point-R
Actual Capsule Dia. (To Be Established By Manufacturer)
N
J
F = xx.xx ± 1.0 M M. 3
G = xx.xx M M. Minimum 3
H = 24.5 M M. Maximum
J = 70.0 M M. Maximum
Reference Plane
C_L of Light Source Base

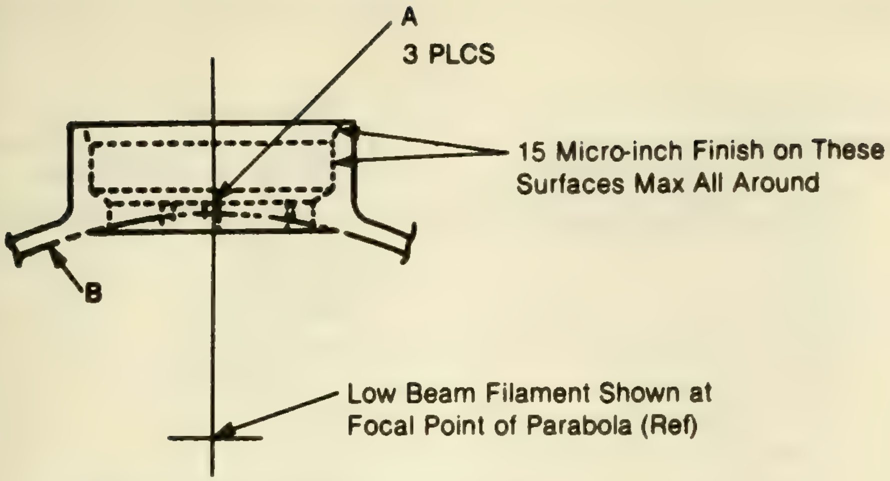
1 Glass Capsule Periphery Shall be Optically Distortion Free Between the Planes Perpendicular to the Centerline at Points P and R.

2 Diameter "H" Shall be Concentric with the Centerline of the Light Source Base.

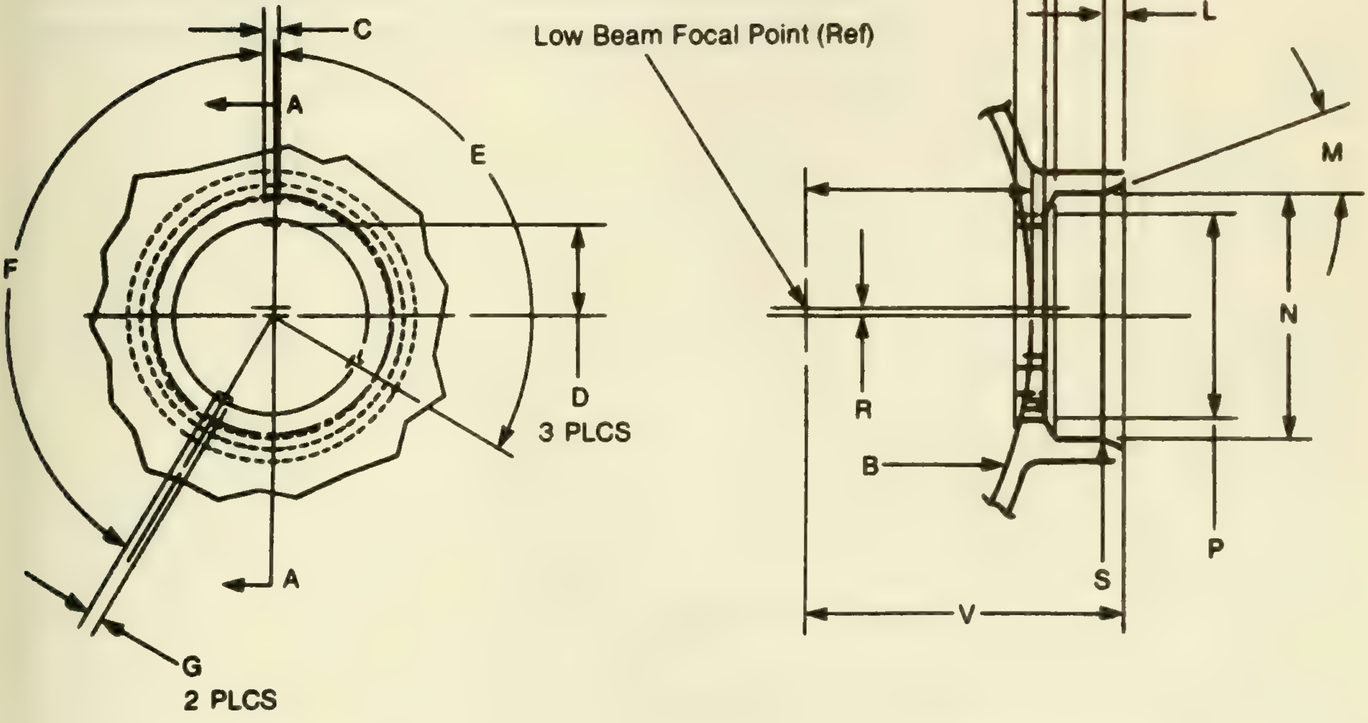
3 Exact Values of F and G Shall be Determined by Using the Following:
F = (N/2) Tan 38
G = (N/2) Tan 43

4 Entire Radius and Distorted Glass Shall be Covered to the Plane Passing Through Point "P", Perpendicular to the Glass Capsule Centerline.

Figure 3-5. Halogen Capsule


A
3 PLCS
15 Micro-inch Finish on These Surfaces Max All Around
B
Low Beam Filament Shown at Focal Point of Parabola (Ref)

Side View-Rotated 90°



Bottom View

Side View (Section A)

SCALE 1:1

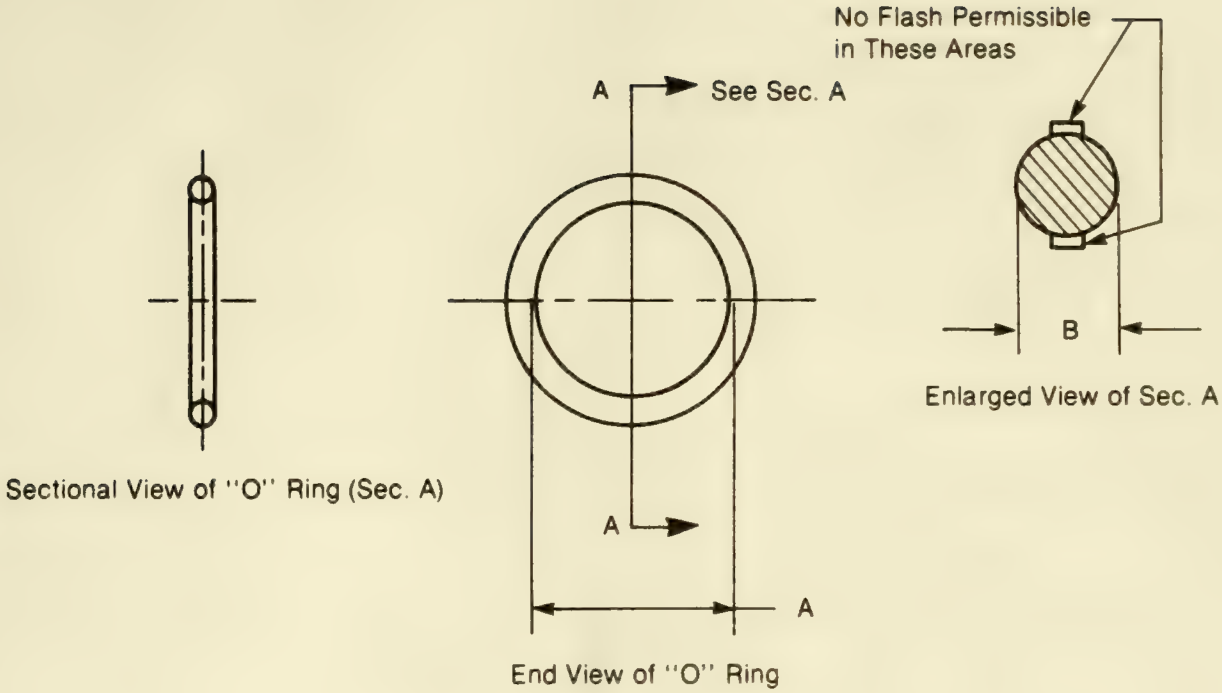
Figure 3-7. Socket (in reflector)

(See reverse page for dimensional specifications)

Specifications

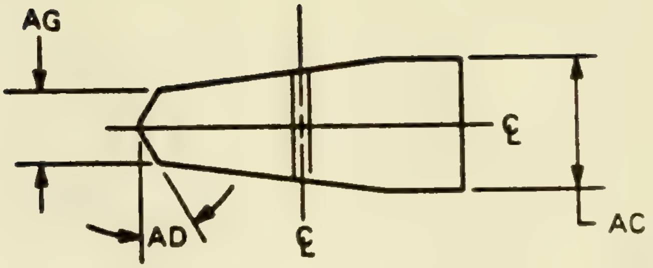
Dimension	Inches	Millimeters
B	Ref Line Lamp Parabola	Ref Line Lamp Parabola
C	.079 ± .002 + .002 Either side of CL	2.00 ± .05 .05 Either Side of CL
D	.502	12.75
E	120°	120°
F	150°	150°
G	.079	2.00
H	.596	15.15
J	.433	11.00
K	.374	9.50
L	.108	2.75
N	(1.350 to 1.346) .002 Either Side of CL	(34.30 to 34.20) .05 Either side of CL
P	(1.132 to 1.128) .002 Either side of CL	(28.75 to 28.65) .05 Either side of CL
R	.045	1.15

Figure 3-8. Dimensional Specifications

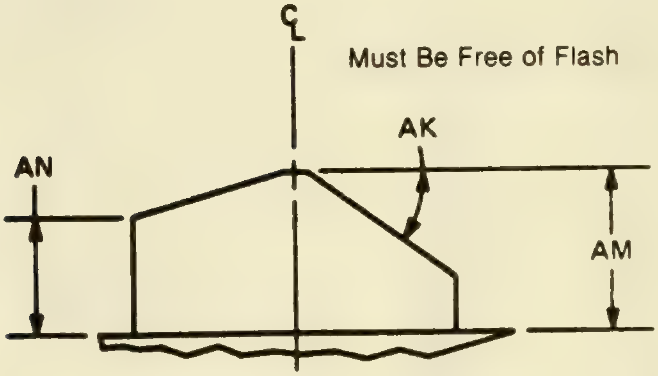

No Flash Permissible in These Areas
A
See Sec. A
B
Enlarged View of Sec. A
Sectional View of "O" Ring (Sec. A)
A
A
End View of "O" Ring

Dimensions	Inches	Millimeters
A	1.109 ± .012	28.17 ± 0.30
B	.139 ± .004	3.53 ± 0.10

Figure 3-9. 'O' Ring



Exploded View W Four Times Size



Exploded View of Locking Feature

Figure 3-10. Exploded Views

Letter	*Inches*	*Millimeters*
AC	.179	4.55
AD	30°	30°
AG	.098	2.50
AK	35°	35°
AM	.217	5.50
AN	.157	4.00

Figure 3-11. Dimensional Specifications

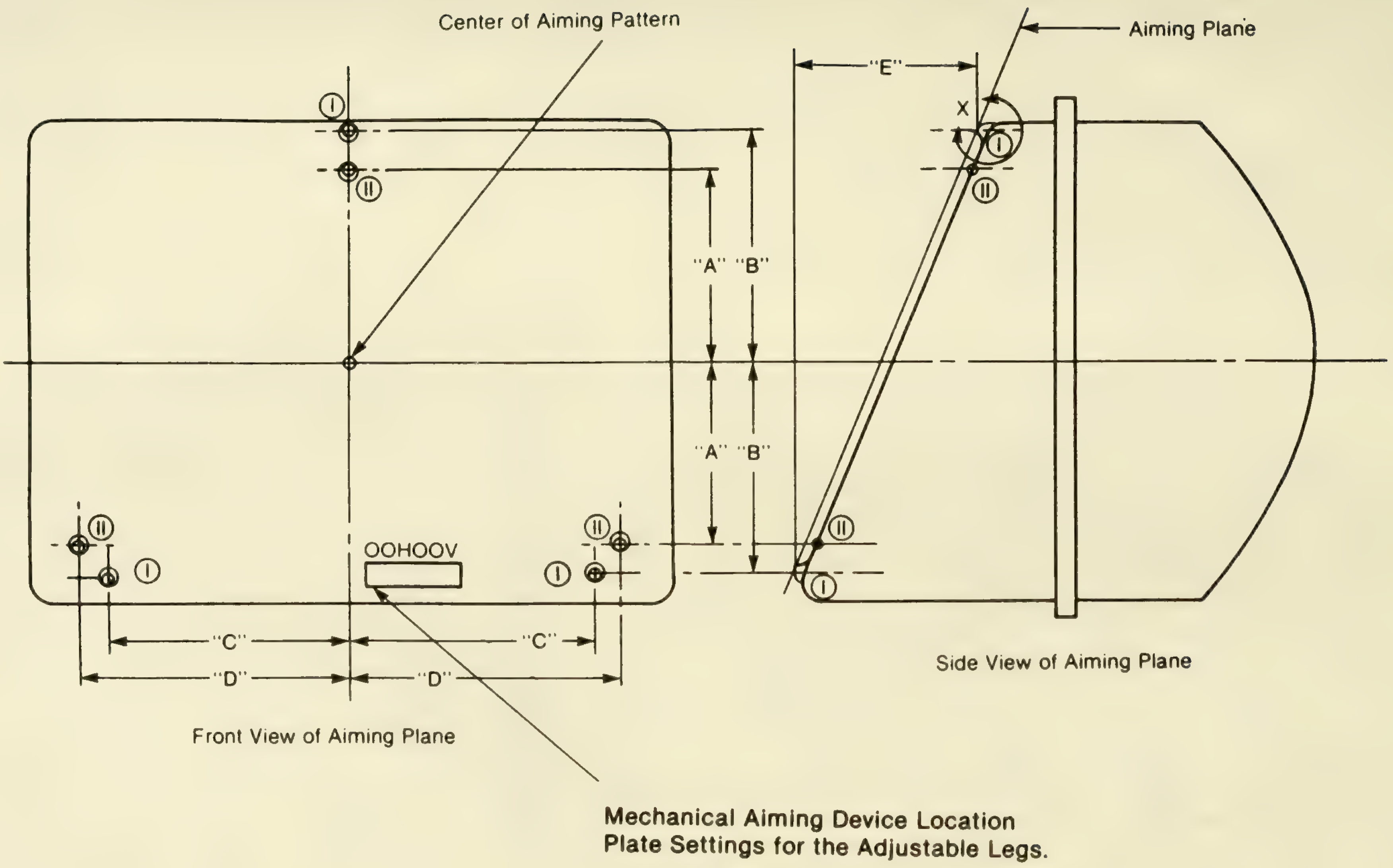

Center of Aiming Pattern
Aiming Plane
"E"
X
I
II
"A" "B"
"A" "B"
OOHOOV
"C"
"D"
Front View of Aiming Plane
Side View of Aiming Plane
Mechanical Aiming Device Location
Plate Settings for the Adjustable Legs.

Figure 4-1. Dimensional Specifications for Location of Aiming Pads on Replaceable Bulb Headlamp Units

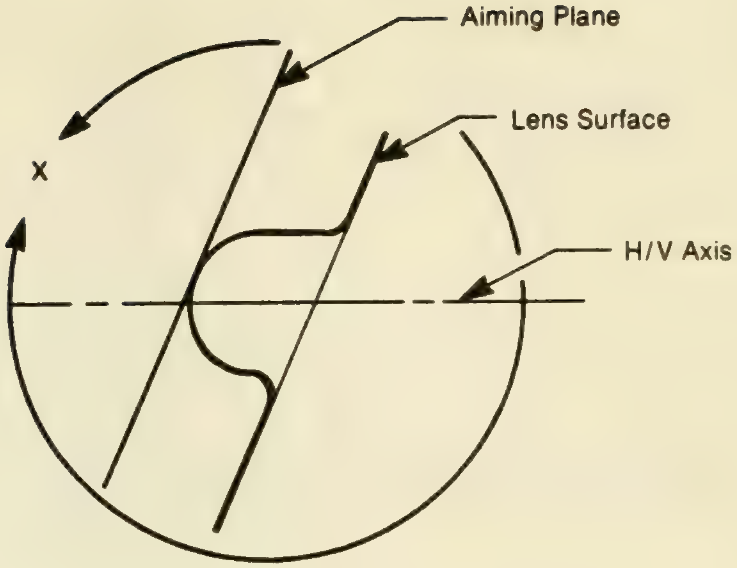
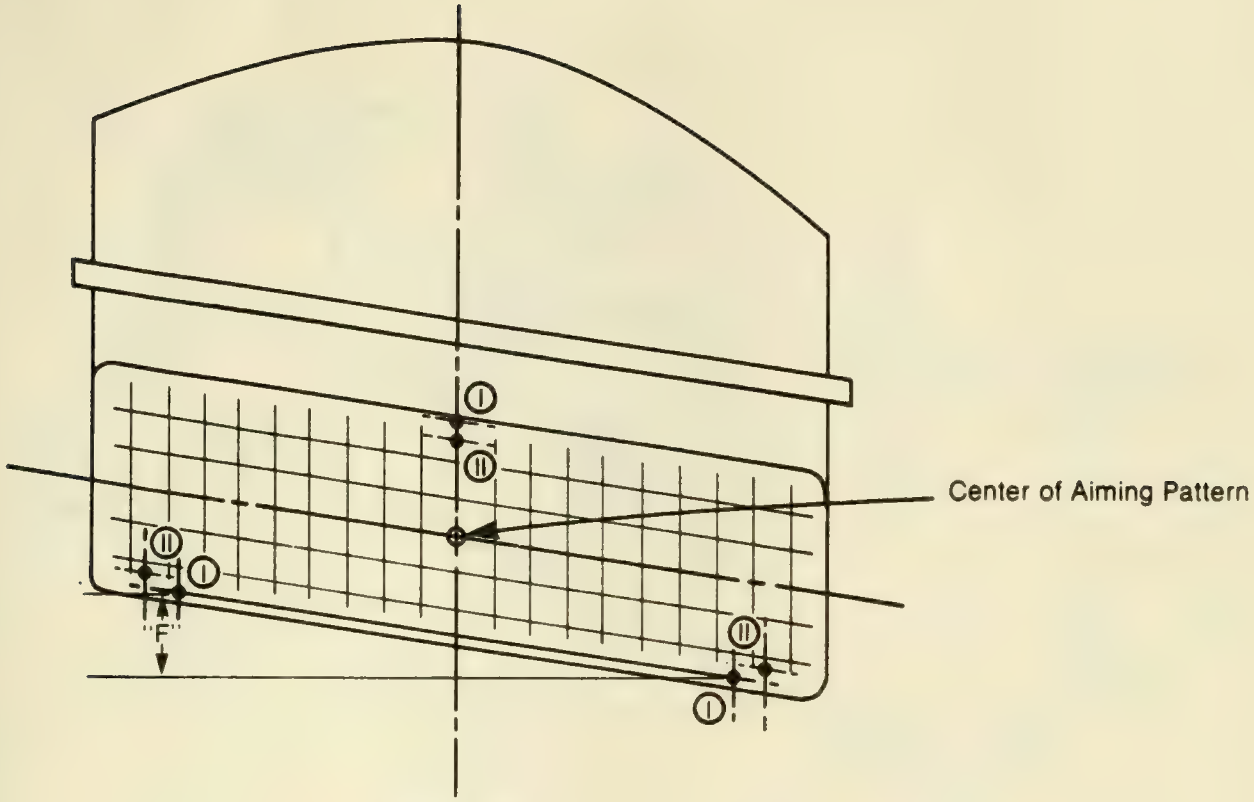


Figure 4-2. Detail Example of Aiming Pad



NOTES

- Group I or Group II aiming pad locations may be used
- Group I aiming pad location (front view) is that prescribed for 2B1 sealed beam units.
- Group II aiming pad location (front view) is that prescribed for 1A1 2A1 sealed beam units

Figure 4-3. Specifications for Location of Aiming Pads on Replaceable Bulb

(50 F.R. 21052. May 22, 1985. Effective: May 15, 1985)

Dimension	*Millimeters*	*Inches*
A	42.16 ± 0.25	1.660 ± 0.010
B	60.05 ± 1.00	2.364 ± 0.039
C	64.0 ± 1.00	2.520 ± 0.039
D	68.58 ± 0.51	2.700 ± 0.020
E	Mechanical aiming device locating plate setting for the vertical adjustable leg.	
F	Mechanical aiming device locating plate setting for the horizontal adjustable leg.	

Figure 4-4. Dimensional Specifications

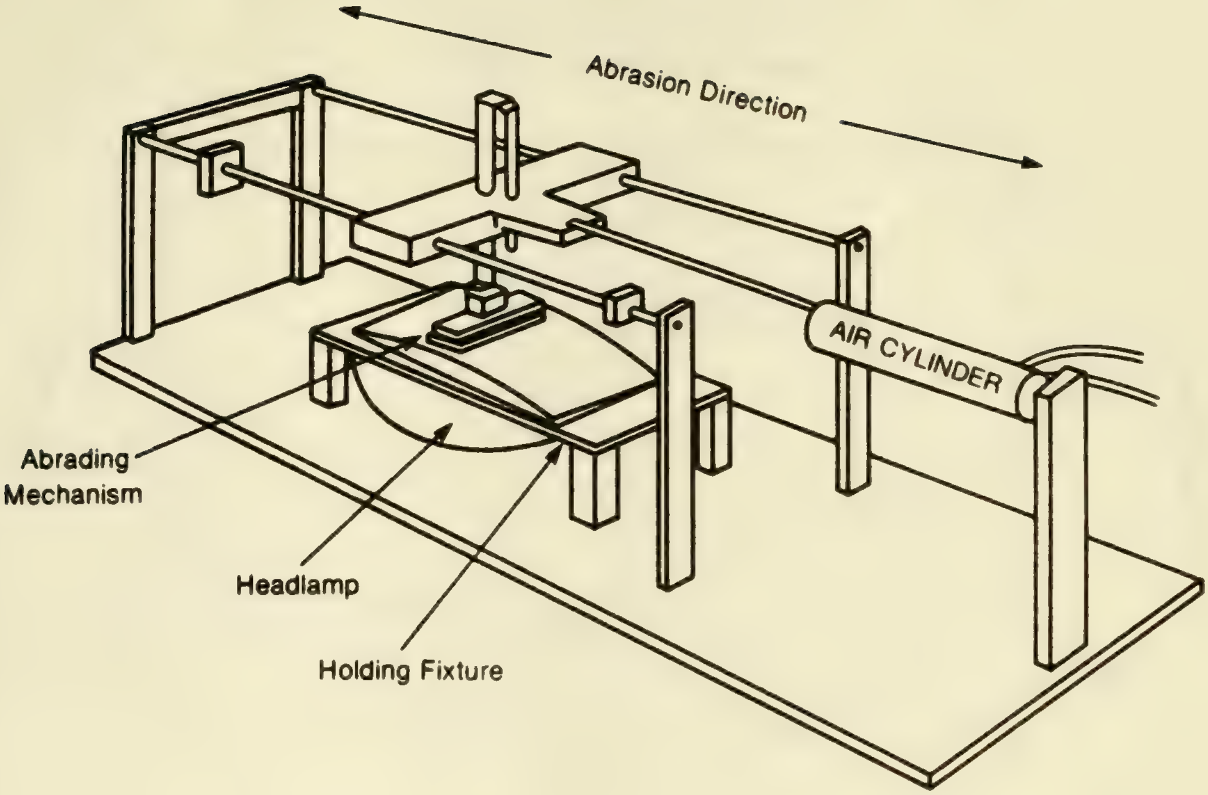
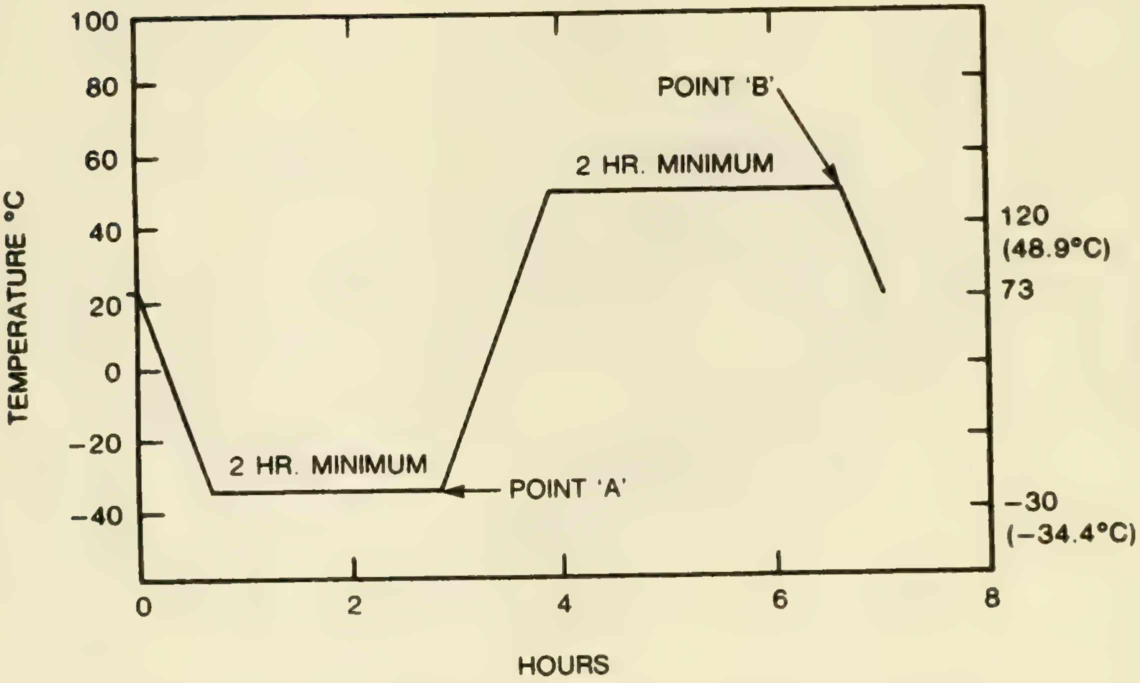


Figure 5. Abrasion Test Fixture

Ambient Temperature Transition Rates:
Minimum 0.6°C (1°F) Per Minute
Maximum 4°C (8°F) Per Minute



Note: Ambient Conditions 73°F ± 7°(23°C ± 4) and 30 ± 10% RH.

Figure 6. Thermal Cycle Profile

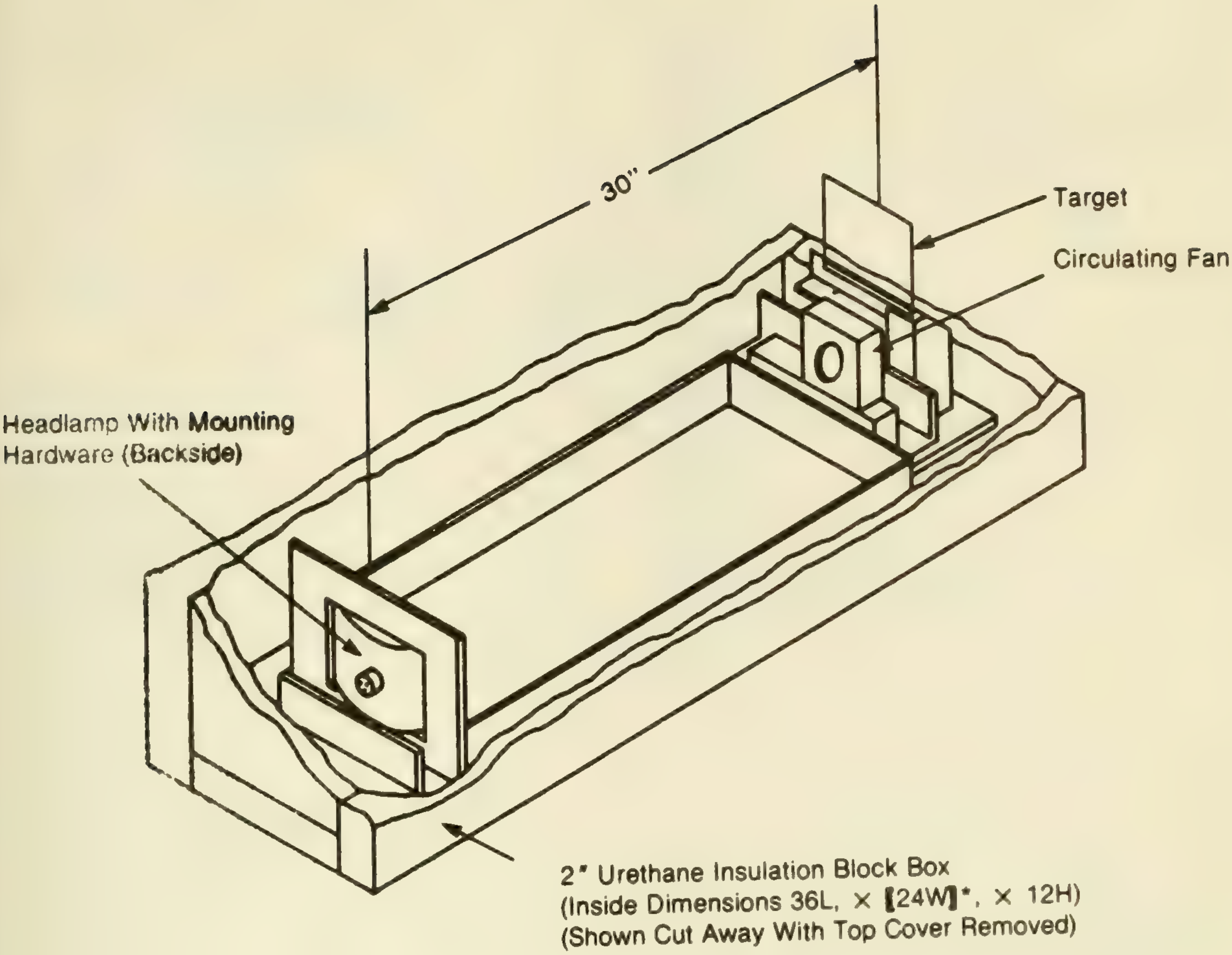
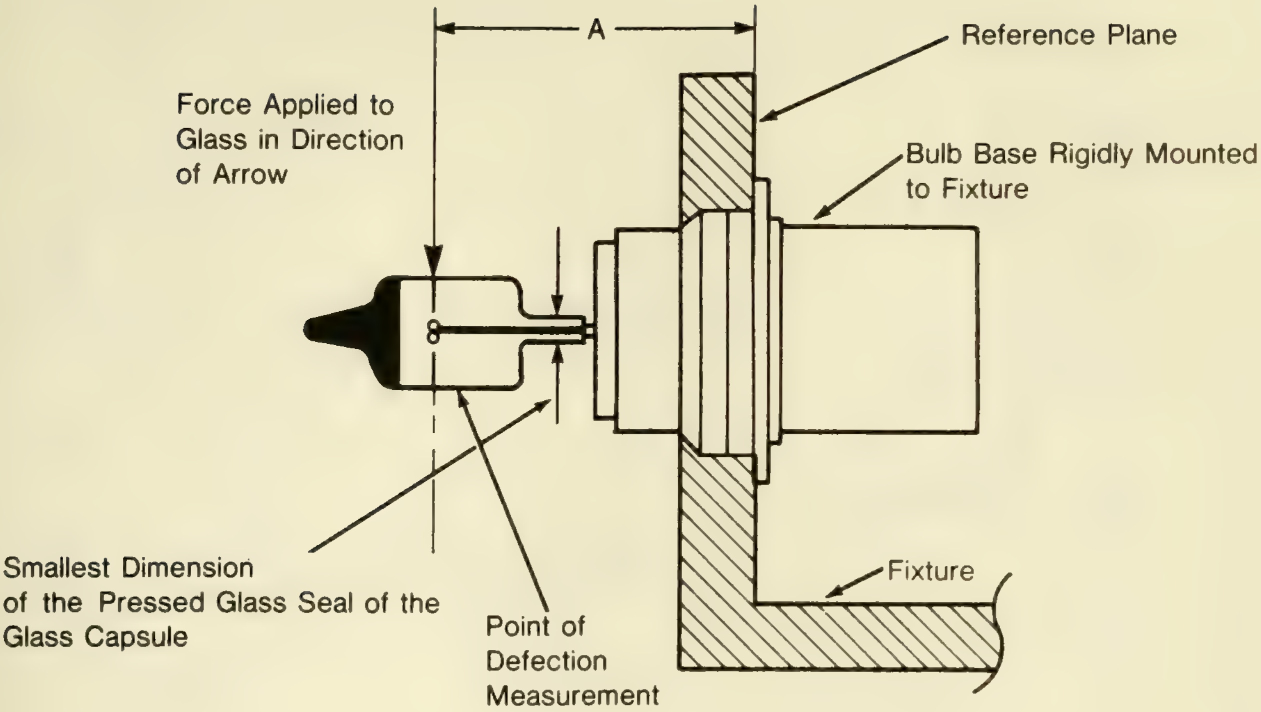

30"
Target
Circulating Fan
Headlamp With Mounting Hardware (Backside)
2" Urethane Insulation Block Box
(Inside Dimensions 36L, × [24W]*, × 12H)
(Shown Cut Away With Top Cover Removed)

Figure 7. Dirt/Ambient Test Setup

* [50 F.R. 21052—May 22, 1985. Effective: May 15, 1985]


A
Reference Plane
Force Applied to Glass in Direction of Arrow
Bulb Base Rigidly Mounted to Fixture
Smallest Dimension of the Pressed Glass Seal of the Glass Capsule
Point of Defection Measurement
Fixture

Standardized Replaceable Light Source Type	Dimension "A"
HB1	44.50 ± 0.38 MM (1.75 ± 0.015 In)
HB3	31.50 ± 0.20 MM (1.24 ± 0.008 In)
HB4	31.50 ± 0.20 MM (1.24 ± 0.008 In)

Figure 8 - Bulb Deflection Test

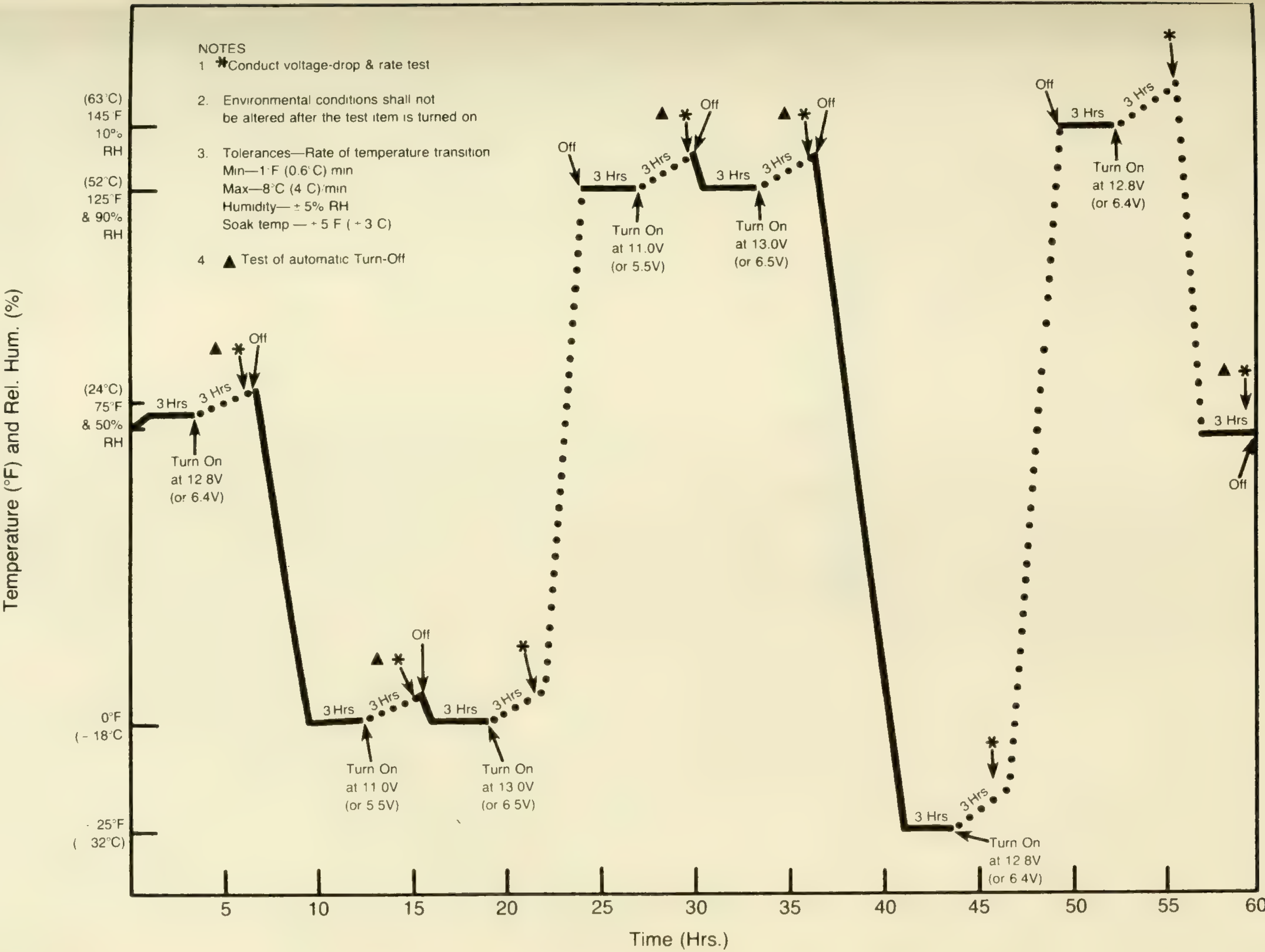
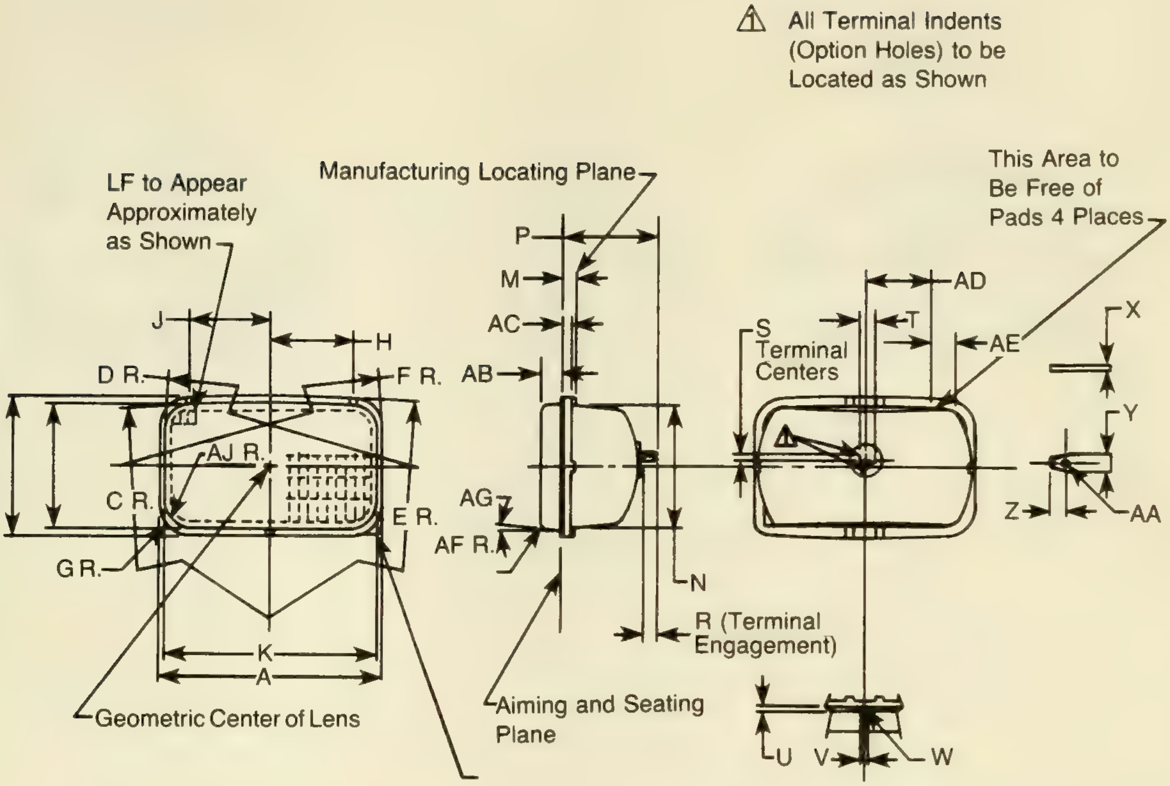


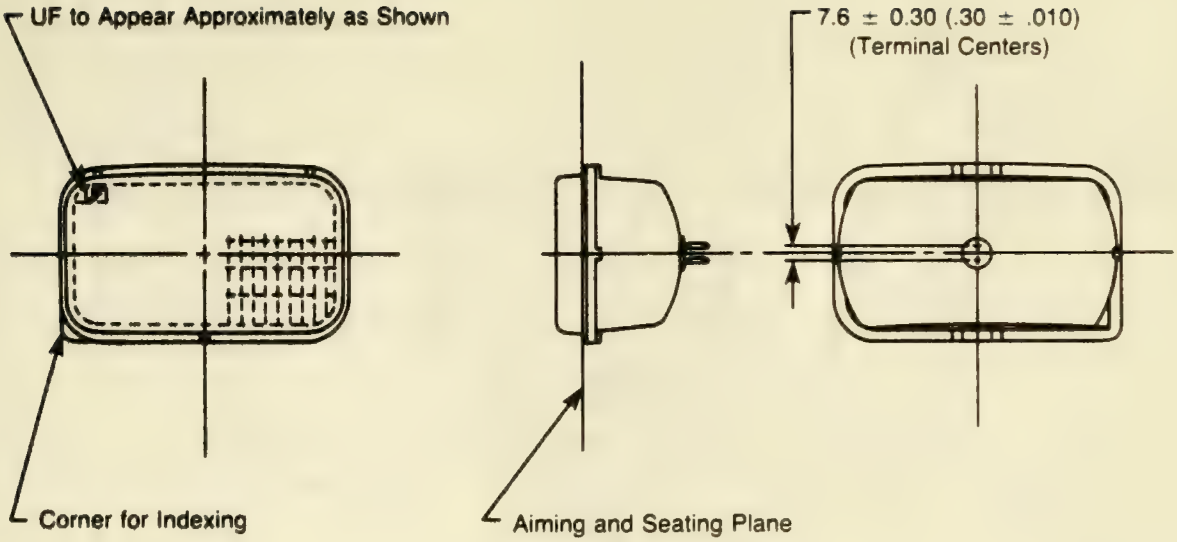
Figure 9. Temperature-Humidity Environmental Test Profile

See page PART 571; S 108-10
for Figure 10


All Terminal Indents (Option Holes) to be Located as Shown
LF to Appear Approximately as Shown
Manufacturing Locating Plane
This Area to Be Free of Pads 4 Places
J
H
D R.
F R.
AJ R.
C R.
E R.
G R.
K
A
Geometric Center of Lens
P
M
AC
AB
AG
AF R.
N
R (Terminal Engagement)
Aiming and Seating Plane
AD
S Terminal Centers
T
AE
X
Y
Z
AA
U
V
W

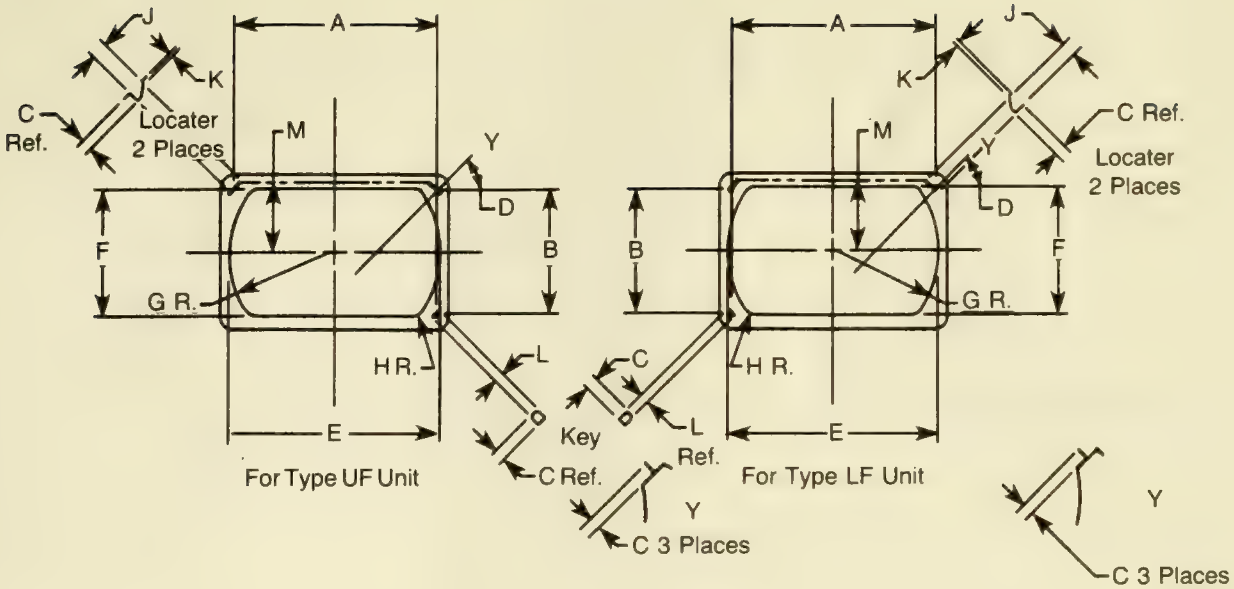
Letter	Inch	MM	Letter	Inch	MM
A	$5.93^{+.050}_{-.040}$	$150.50^{+1.20}_{-1.00}$	R	.41 Min.	10.5 Min.
B	$3.64^{+.050}_{-.040}$	$92.50^{+1.20}_{-1.00}$	S	.15 ± .010	3.8 ± 0.30
C	63.0 ± 3.94	1600.0 ± 100.0	T	.41 ± .010	10.43 ± 0.30
D	23.6 ± 1.97	600.0 ± 50.0	U	.024 Min.	0.60 Min.
E	63.0 ± 3.94	1600.0 ± 100.0	V	.315 Max.	8.0 Max.
F	23.8 ± 1.97	600.0 ± 50.0	W	Radius	Radius
G	.787 ± .010	20.00 ± 0.30	X	.032 ± .002	0.82 ± 0.04
H	2.16 ± .010	55.0 ± 0.30	Y	.110 ± .004	2.80 ± 0.10
J	2.16 ± .010	55.0 ± 0.30	Z	104 ± .010	2.65 ± 0.30
K	$5.689^{+.008}_{-.040}$	$144.50^{+0.20}_{-1.00}$	AA	.051 ± .010 Dia.	1.30 ± 0.30 Dia.
L	$3.252^{+.008}_{-.040}$	$82.60^{+0.20}_{-1.00}$	AB	.56 ± .020	14.3 ± 0.50
M	.46 Max.	11.7 Max.	AC	.295 Max.	7.50 Max.
N	3.19 Max.	81.0 Max.	AD	1.77	45.0
P	2.87 Max.	73.0 Max.	AE	.63	16.0
			AF	.13 ± .02	3.2 ± 0.5
			AG	5° ± 1°	5° ± 1°
			AH	.24 ± .02	6.0 ± 0.5
			AJ	63 Min.	16.0 Min.

Figure 11. Type LF Rectangular Sealed Beam Headlamp Unit



Note: Same as Type LF Except as Shown (.xx) Inch Dim.

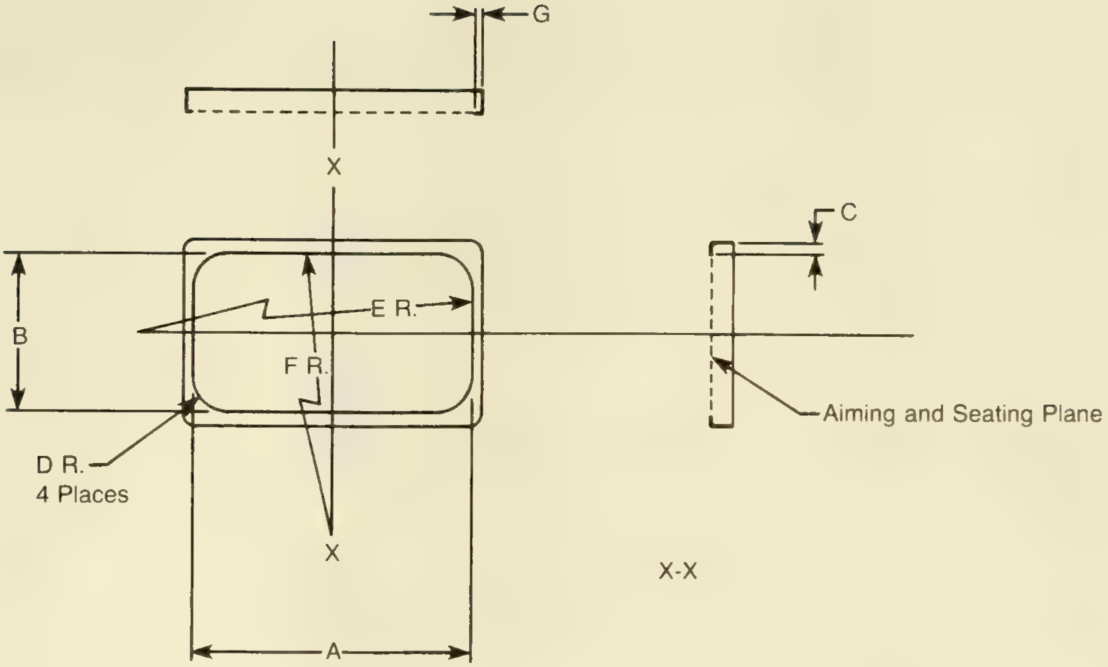
Figure 12. Type UF Rectangular Sealed Beam Headlamp Unit



Mounting Ring

Letter	Inch	MM
A	5.433 $^{+.012}_{-.000}$	138.00 $^{+0.30}_{-0.00}$
B	3.150 $^{+.012}_{-.000}$	80.00 $^{+0.30}_{-0.00}$
C	.315 ± .02	8.0 ±0.5
D	45° 3 Places	45° 3 Places
E	5.63 ± .010	143.0 ± 0.30
F	3.307 ± .010	84.00 ± 0.30
G	2.79 ± .12	71.0 ± 3.0
H	.32 ± .04	8.0 ± 1.0
J	.39 ± .04	10.0 ± 1.0
K	.17 ± .07	4.3 ± 1.7
L	.24 ± .04	6.0 ± 1.0
M	1.823 ± 013	46.30 ± 0.30

Figure 13. **Front View of Keys of Locators for Type LF and UF Rectangular Sealed Beam Headlamp Unit Mounting Rings**



Aiming Ring

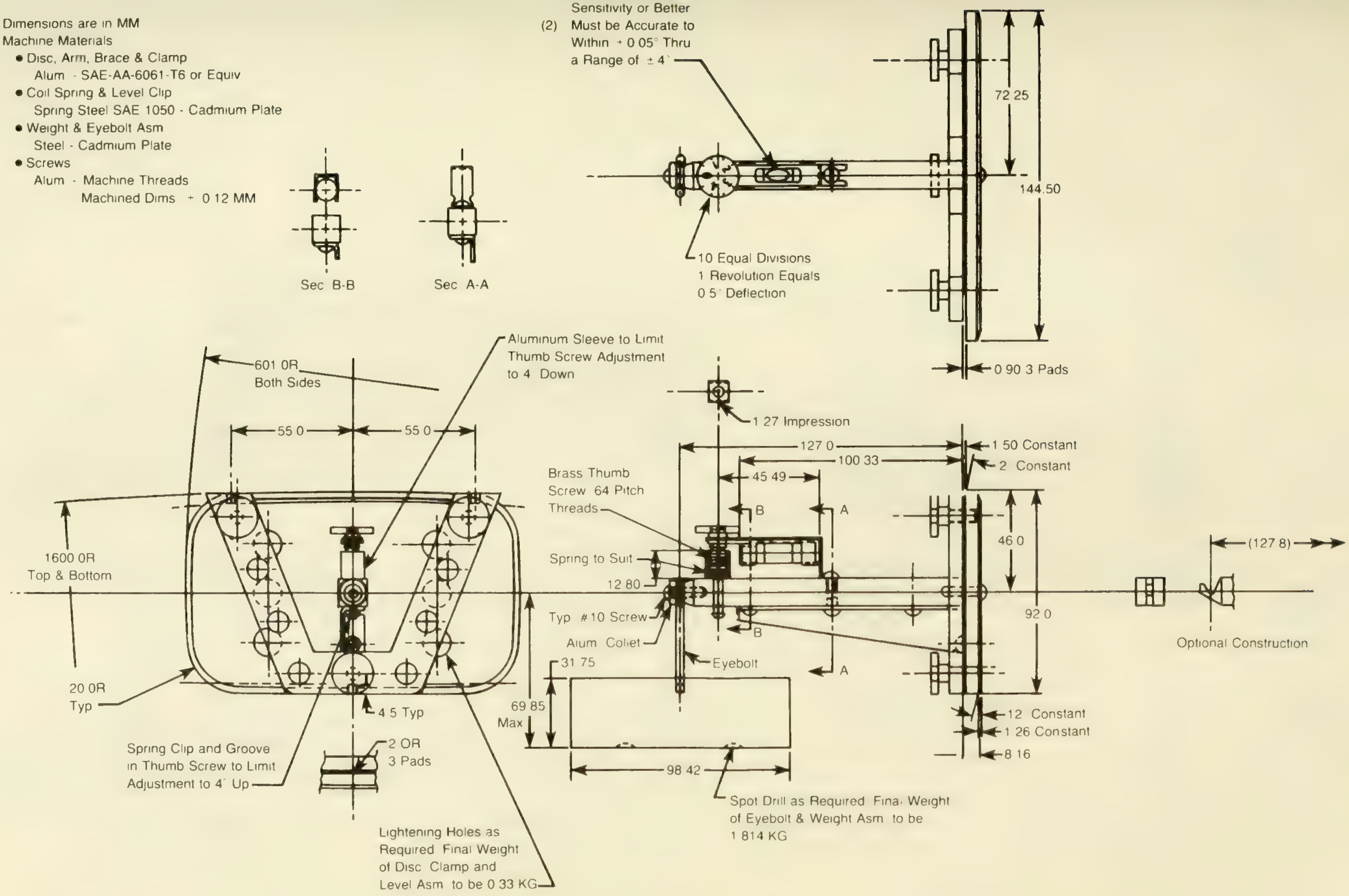
Letter	Inch	MM
A	5.721 ± .006	145.30 ± 0.30
B	3.284 ± .006	83.40 ± 0.30
C	.213 Min.	5.40 Min.
D	.670 Max.	17.00 Max.
E	23.7 ± 2.0	602.2 ± 50.0
F	63.0 ± 3.93	1600.0 ± 100.0
G	.134 Min.	3.40 Min.

Figure 14. Aiming/Seating Ring for Type LF and UF Rectangular Sealed Beam Headlamp Units

UPPER BEAM			LOWER BEAM		
Test Points deg	cd. max.	cd. min.	Test Points deg	cd. max.	cd. min.
2U-V	—	1,500	10U-90U	125	—
1U-3R and 3L	—	5,000	1U-1-1/2L to L	700	—
H-V	70,000	40,000	1/2U-1-1/2L to L	1,000	—
			1/2D-1-1/2L to L	3,000	—
H-3R and 3L	—	15,000			
H-6R and 6L	—	5,000	1/2U-1R to 3R	2,700	—
H-9R and 9L	—	3,000	1/2D-1-1/2R	20,000	10,000
H-12R and 12L	—	1,500	1D-6L	—	1,000
			1-1/2D-2R	—	15,000
1-1/2D-V	—	5,000	1-1/2D-9L and 9R	—	1,000
1-1/2D-9R and 9L	—	2,000	2D-15L and 15R	—	850
2-1/2D-V	—	2,500	4D-4R	12,500	—
2-1/2D-12R and 12L	—	1,000			
4D-V	5,000	—	4D-V	7,000	—
			H-V	5,000	—

Figure 15. Photometric Test Point Values

Headlamp Test Fixture 92 x 150 MM



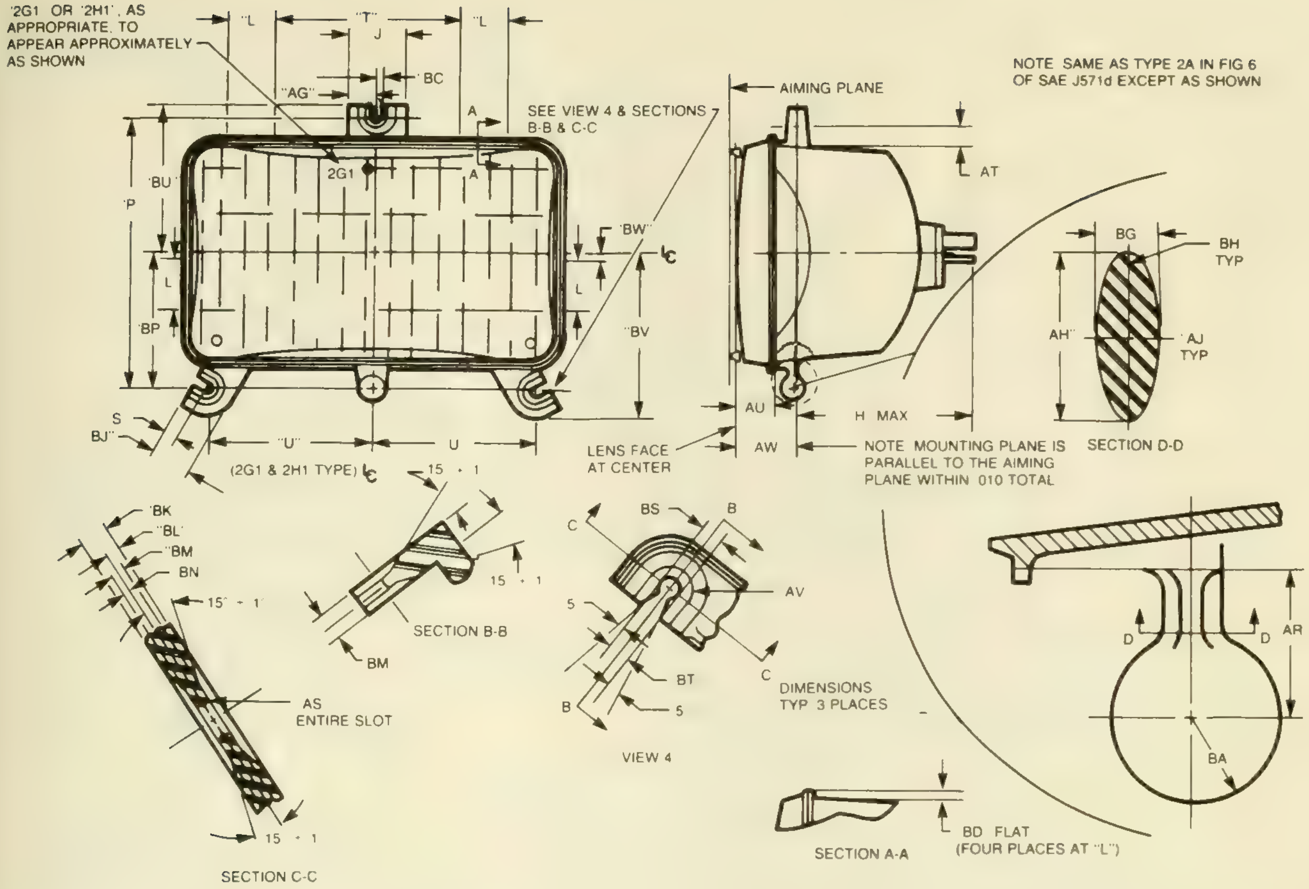
Dimensions are in MM
Machine Materials
- Disc, Arm, Brace & Clamp
  Alum - SAE-AA-6061-T6 or Equiv
- Coil Spring & Level Clip
  Spring Steel SAE 1050 - Cadmium Plate
- Weight & Eyebolt Asm
  Steel - Cadmium Plate
- Screws
  Alum - Machine Threads
  Machined Dims + 0 12 MM

(1) 5.08 Bubble Movement Must Indicate 0 25° Sensitivity or Better
(2) Must be Accurate to Within + 0 05° Thru a Range of ± 4°

Figure 16. Deflectometer

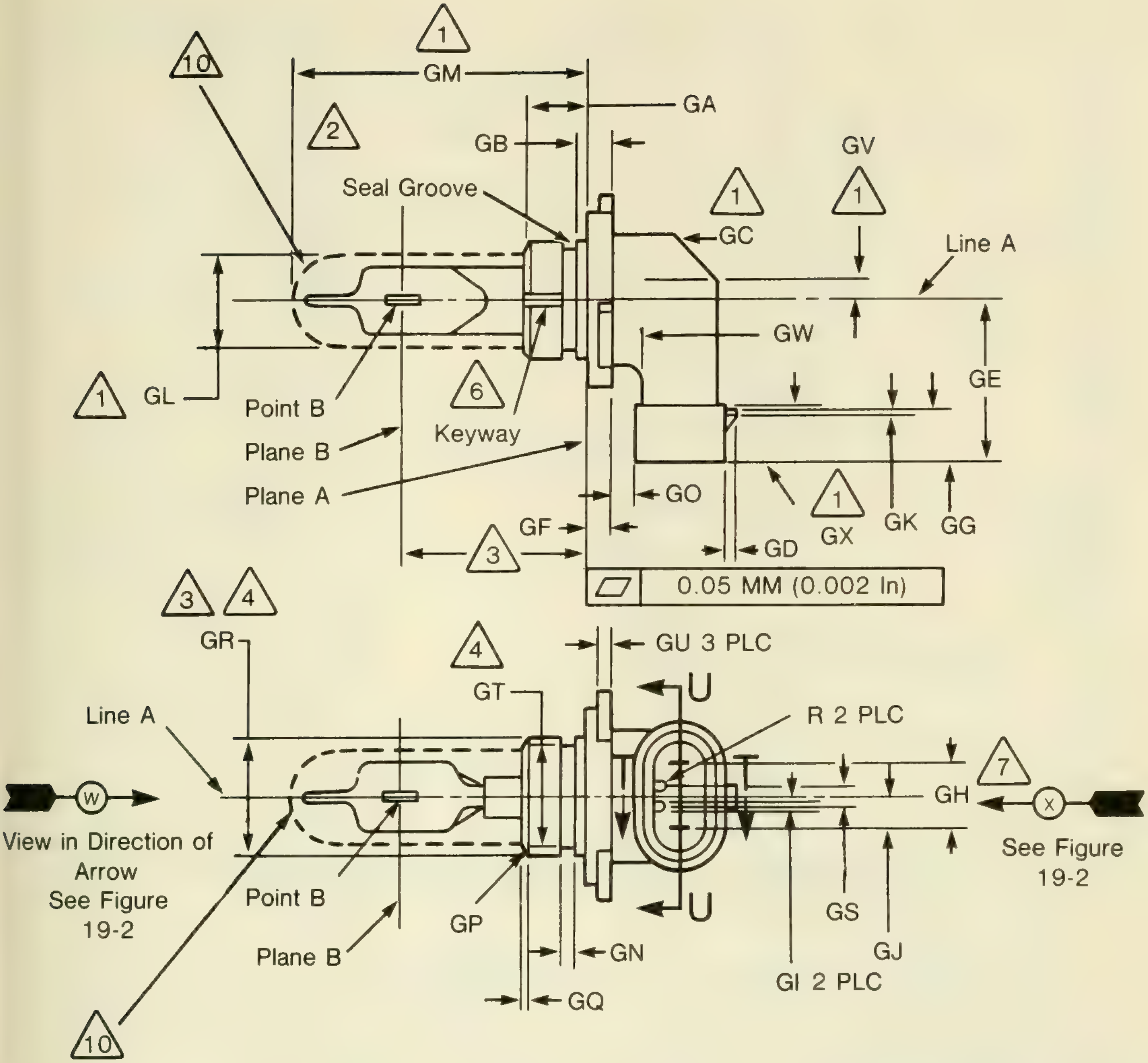
Upper Beam			Lower Beam		
Test Points deg	cd max.	cd min.	Test Points deg	cd max.	cd min.
2U-V	—	1,500	10U-90U	125	—
1U-3R and 3L	—	5,000	1U-1-1/2L to L	700	—
H-V	75,000	40,000	1/2U-1-1/2L to L	1,000	—
			1/2D-1-1/2L to L	3,000	—
			1-1/2U-1R to R	1,400	—
H-3R and 3L	—	15,000			
H-6R and 6L	—	5,000	1/2U-1R to 3R	2,700	—
H-9R and 9L	—	3,000	1/2D-1-1/2R	20,000	10,000
H-12R and 12L	—	1,500	1D-6L	—	1,000
			1-1/2D-2R	—	15,000
1-1/2D-V	—	5,000	1-1/2D-9L and 9R	—	1,000
1-1/2D-9R and 9L	—	2,000	2D-15L and 15R	—	850
2-1/2D-V	—	2,500	4D-4R	12,500	—
2-1/2D-12R and 12L	—	1,000			
4D-V	12,000	—			

Figure 17 - Photometric Test Point Values (2-Lamp Systems)



LETTER	IN	mm	LETTER	IN	mm
H MAX	3.499 ± 0.015	88.868 ± 0.381	BA	0.220 SPHER.R	5.59 SPER.R
J	1.00 ± 0.015	25.40 ± 0.381	BC	0.197 ± 0.005	5.004 ± 0.127
L	1.25 MIN	31.75	BD	0.040 MIN	1.016 MIN
P	4.80 ± 0.026	121.92 ± 0.660	BG	0.150 ± 0.010	3.81 ± 0.254
S	0.250 ± 0.005	6.35 ± 0.127	BH	0.032R	0.813R
T	2.26 ± 0.01	57.40 ± 0.25	BJ	0.720 ± 0.015	18.288 ± 0.381
U	2.82 ± 0.015	71.63 ± 0.381	BK	0.125 ± 0.005	3.175 ± 0.127
AG	0.500 ± 0.01	12.70 ± 0.25	BL	0.062 ± 0.005	1.575 ± 0.127
AH	0.410 ± 0.010	10.414 ± 0.254	BM	0.064 ± 0.004	1.62 ± 0.102
AJ	0.42 ± 0.010	10.668 ± 0.254	BN	0.032 ± 0.004	0.813 ± 0.102
AR	0.37 MIN	9.40 MIN	BP	2.45 ± 0.015	62.23 ± 0.381
AS	0.03R + 0.0, -0.03	0.76R + 0.0 -0.76	BS	0.178,0.181 DIA	4.521, 4,597 DIA
AT	0.230 MIN	5.84 MIN	BT	0.174, 0.176	4.420, 4.470
AU	0.66 ± 0.040	16.76 ± 1.02	BU	2.73 ± 0.015	69.342 ± 0.381
AV	0.20 ± 0.01R	5.08 ± 0.254	BV	2.980 ± 0.015	75.692 ± 0.381
AW	1.100 ± 0.040	27.94 ± 1.02	BW	0.160 ± 0.01	4.06 ± 0.25

Figure 18 — Dimensional Specifications for Integral Mount Sealed Beam Headlamps, Types G and H



(Also see continuation page)

Figure 19 - Specifications for the Type HB3 Standardized Replaceable Light Source

Dimension	Inches	Millimetres
GA	0.591 Max / 0.217 Min	15.00 Max / 5.50 Min
GB	0.236	6.00
GC	45°	45°
GD	0.079	2.00
GE	1.09	27.8
GF	0.165	4.20
GG	0.346	8.80
GH	0.433	11.00
GI	0.055	1.40
GJ	0.217 ± 0.006	5.50 ± 0.15
GK	0.06	1.5
GL	0.775 Dia	19.68 Dia
GM	2.165	55.00
GN	0.093	2.36
GO	0.157	4.00
GP	45° Chamfer	45° Chamfer
GQ	0.039	1.00
GR	0.787 ± 0.002 Dia	22.00 ± 0.05 Dia
GS	0.138	3.50
GT	0.687 $^{+0.004}_{-0.000}$ Dia	17.46 $^{+0.10}_{-0.00}$ Dia
GU	0.079	2.00
GV	0.138	3.5
GW	0.209 Min	5.30 Min
GX	0.378	9.60

1 Dimensions Shown Are Maximum-May Be Smaller

2 Bulbs Must Be Equipped With a Seal. The Bulb-Seal Assembly Must Withstand a Minimum of 69kPA. (10 P.S.I.G.) When the Assembly Is Inserted into a Cylindrical Aperture of 22.22 ± 0.10 MM (0.875 ± 0.004 IN).

3 See Figure 20-5

4 Diameters Must Be Concentric Within 0.20 MM (0.008 IN).

5 Glass Bulb Periphery Must Be Optically Distortion Free Axially Within the Included Angles About Point B

6 Key and Keyway Are Optional Construction. Keyway Required for Aftermarket Only.

7 Measured at Terminal Base. Terminals Must Be Perpendicular to Base and Parallel Within ±1.5°

8 Diameters Must Be Concentric Within 0.20 MM (0.008 IN).

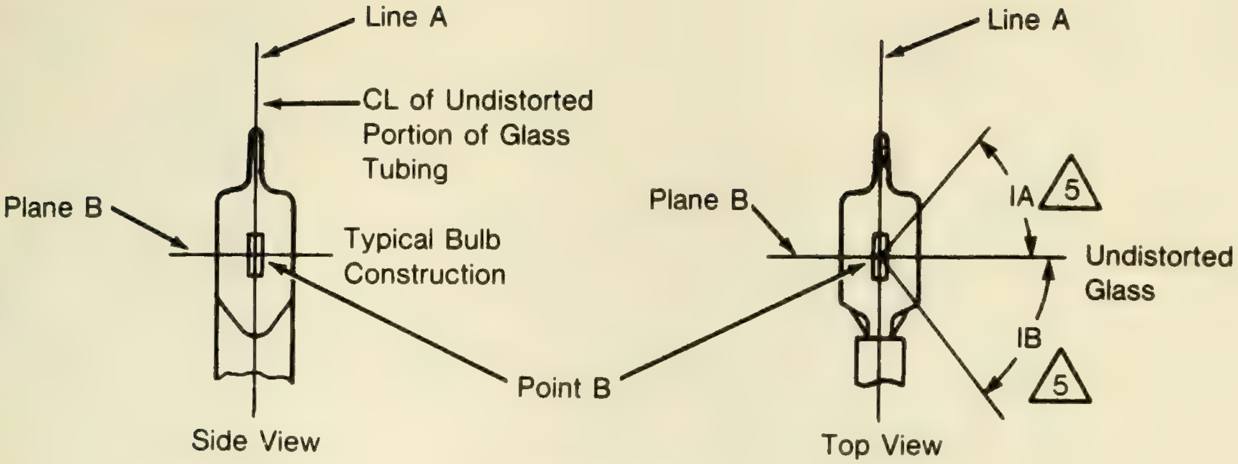
9 Absolute Dimension, No Tolerance

10 Glass Capsule and Supports Shall Not Exceed This Envelope.

Tolerances Unless Otherwise Specified

Inches	Millimetres
2 Place Decimals ± .02	1 Place Decimals ± 0.5
3 Place Decimals ± .010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 19 - (Continued) Specifications for the Type HB3 Standardized Replaceable Light Source



Point B Is Intersection of Plane B and Centerline of Undistorted Glass Tubing

Dimension	Inches	Millimetres
IA	45° Min	45° Min
IB	52° Min	52° Min

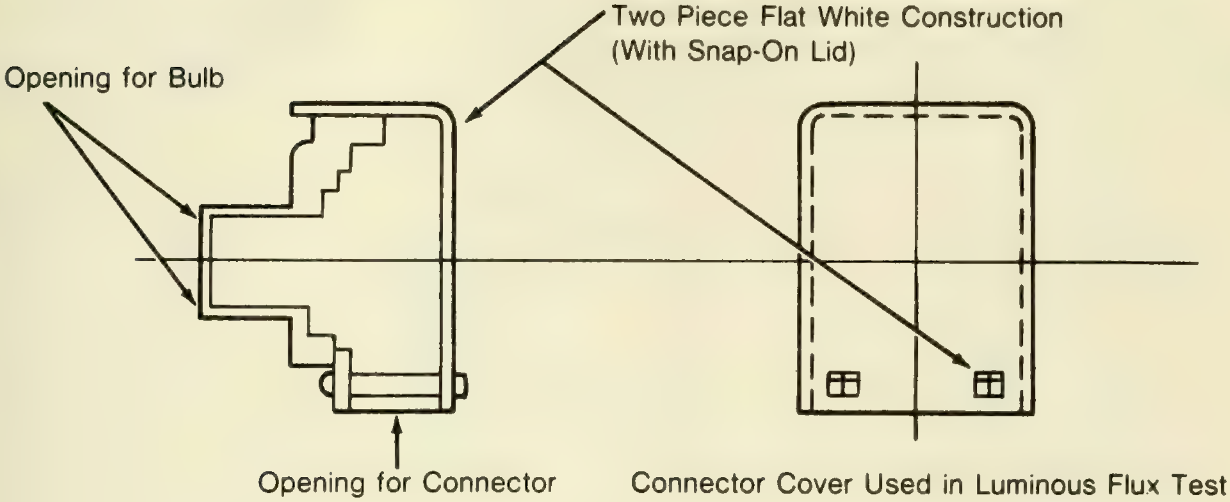
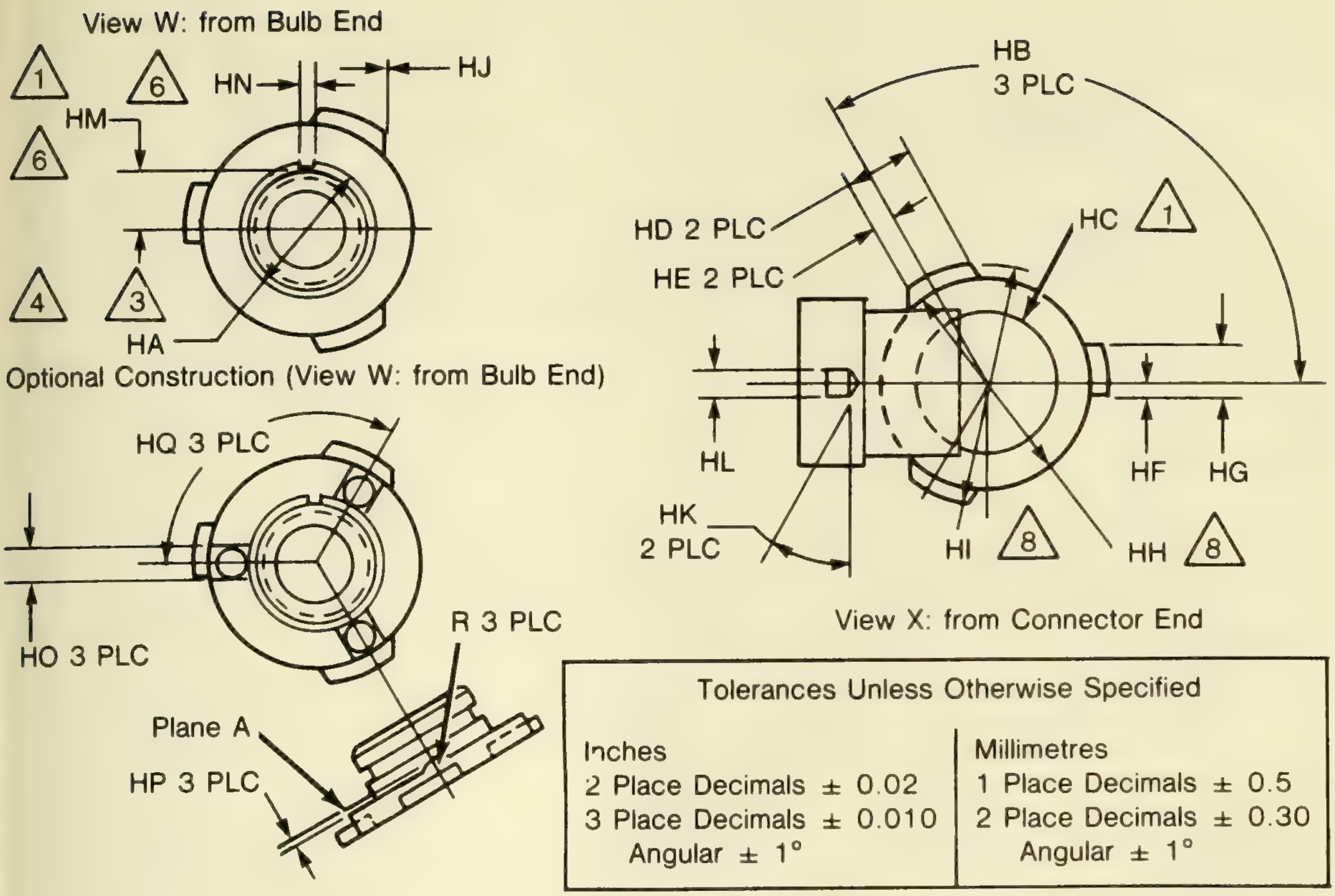

Two Piece Flat White Construction (With Snap-On Lid)
Opening for Bulb
Opening for Connector
Connector Cover Used in Luminous Flux Test

Figure 19-1 - Specifications for the Type HB3 Standardized Replaceable Light Source

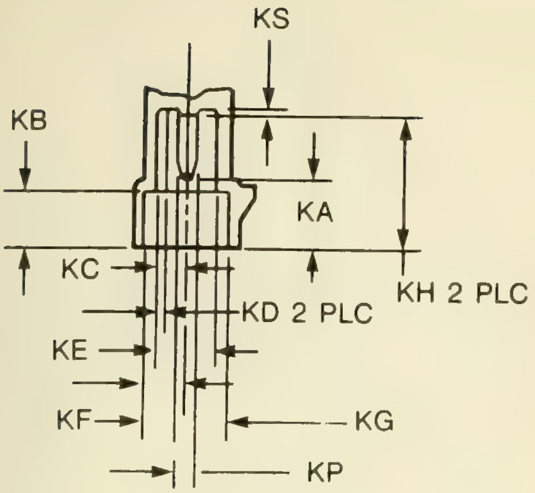


Tolerances Unless Otherwise Specified

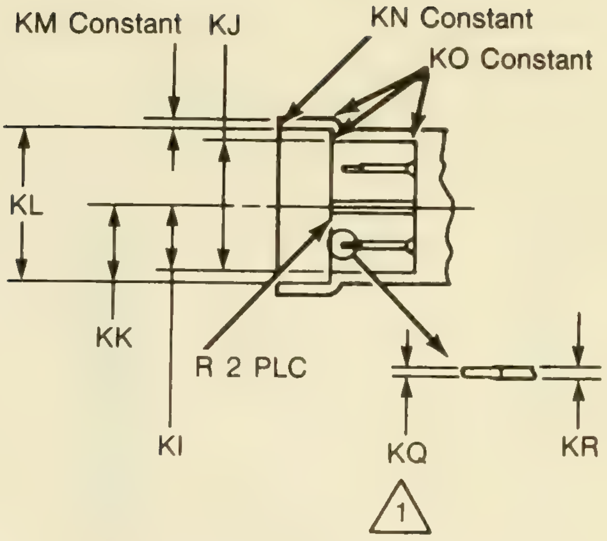
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Dimensions	Inches	Millimetres
HA	0.787 ±0.002 Dia	20.00 ±0.05 Dia
HB	120°±0°30	120°±0°30
HC	0.866 Dia	22.00 Dia
HD	0.394	10.00
HE	0.118	3.00
HF	0.079	2.00
HG	0.315	8.00
HH	1.181 Dia	30.00 Dia
HI	1.417 Dia	36.00 Dia
HJ	3°	3°
HK	30°	30°
HL	0.157	4.00
HM	0.35	8.9
HN	0.079 ±0.004	2.00 ±0.10
HO	0.20	5.0
HP	0.030	0.75
HQ	120° Typ	120° Typ

Figure 19-2 - Specifications for the Type HB3 Standardized Replaceable Light Source



Section T-T (from Fig 19)



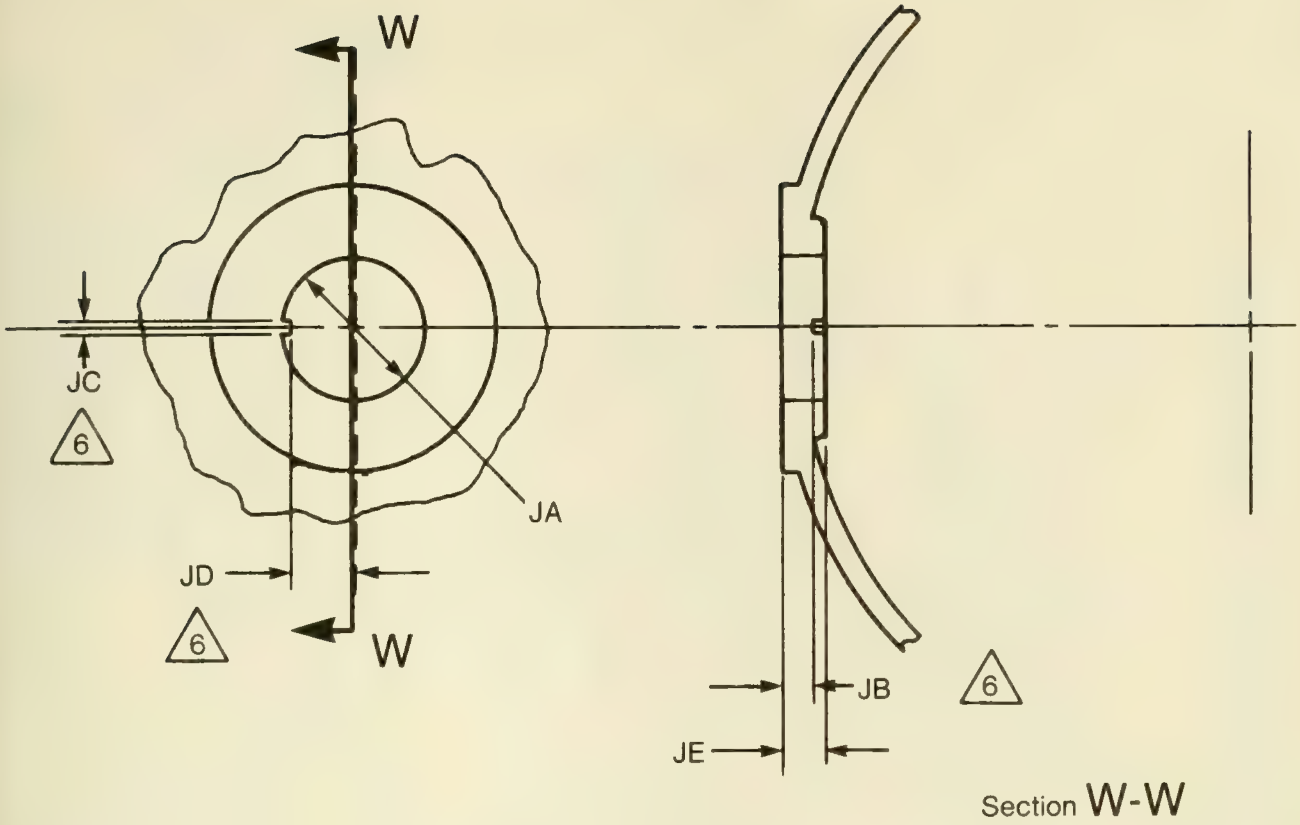
Section U-U (from Fig 19)

Dimensions	Inches	Millimetres
KA	0.384	9.75
KB	0.315	8.00
KC	0.171	4.35
KD	0.055	1.40
KE	0.343	8.70
KF	0.242 ±0.006	6.15 ±0.15
KG	0.484	12.30
KH	0.748	19.00
KI	0.368 ±0.006	9.35 ±0.15
KJ	0.736	18.70
KK	0.439 ±0.006	11.15 ±0.15
KL	0.878	22.30
KM	0.059	1.50
KN	0.03 R	0.8 R
KO	0.016 R	0.40 R
KP	0.110 ±0.004	2.8 ±0.10
KQ	0.024	0.60
KR	0.033 ±0.001	0.83 ±0.03
KS	0.039 Min	1.00 Min

Tolerances Unless Otherwise Specified

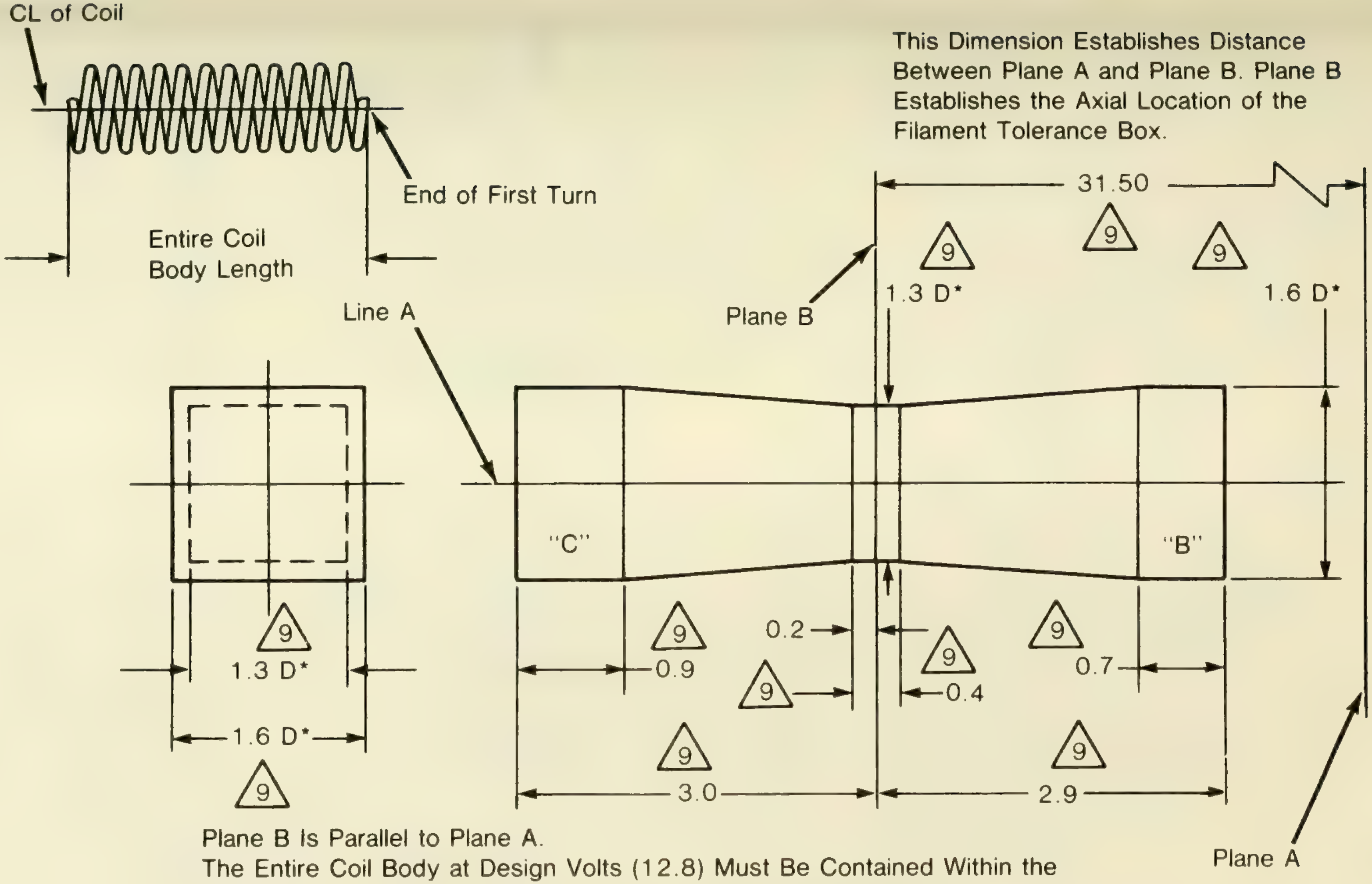
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 19-3 - Specifications for the Type HB3 Standardized Replaceable Light Source



Dimensions	Inches	Millimetres
JA	0.796 ± 0.004 Dia	20.22 ± 0.10 Dia
JB	0.172 $^{+0.010}_{-0.000}$	4.36 $^{+0.30}_{-0.00}$
JC	0.067 ±0.004 +0.004	1.70 ±0.10 +0.10
JD	0.352 −0.000	8.95 −0.00
JE	0.236 Min	6.00 Min

Figure 19-4 - Specifications for the Type HB3 Standardized Replaceable Light Source Socket (in Reflector)



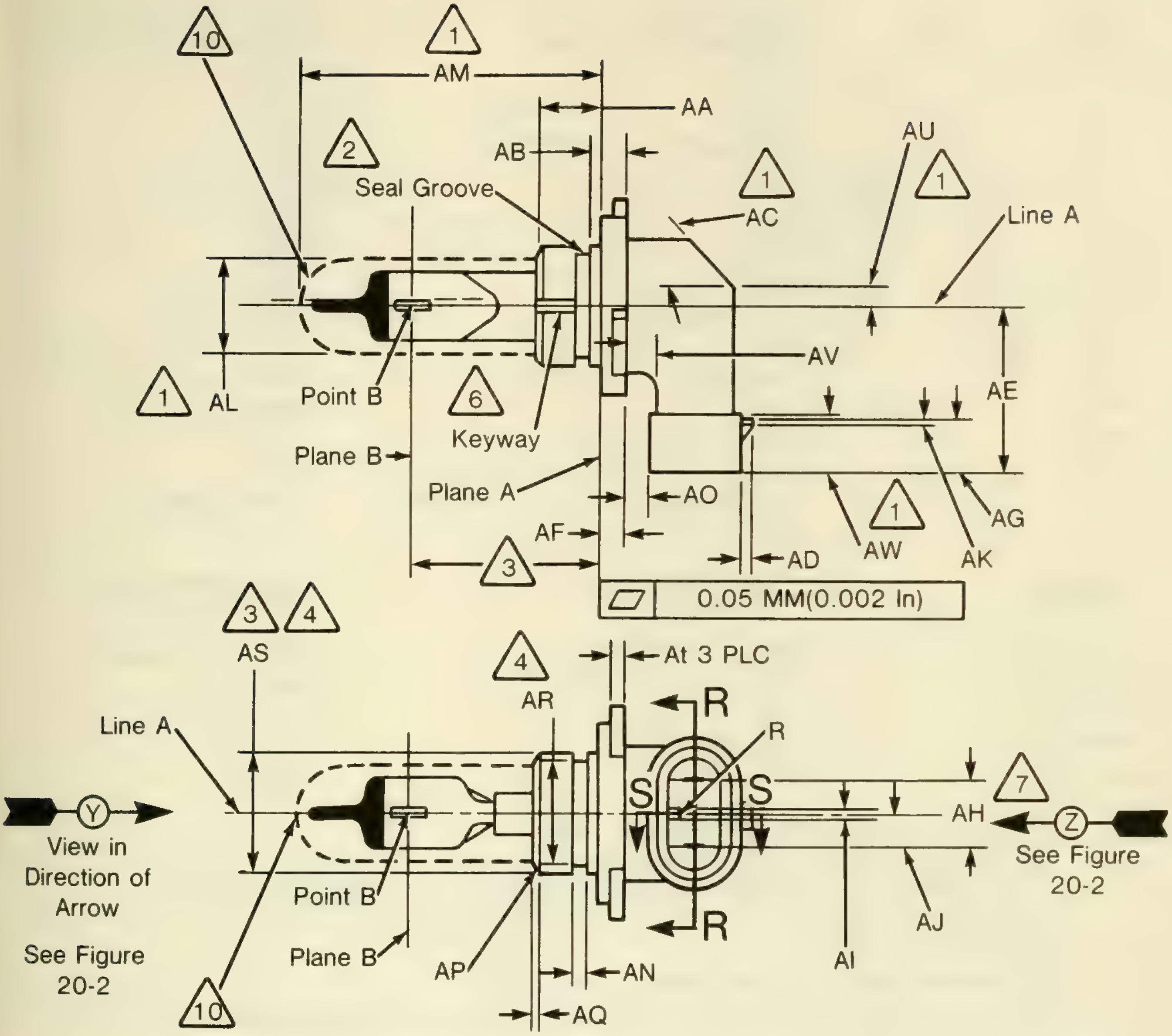
CL of Coil
End of First Turn
Entire Coil Body Length
Line A
Plane B
This Dimension Establishes Distance Between Plane A and Plane B. Plane B Establishes the Axial Location of the Filament Tolerance Box.
31.50
1.3 D*
1.6 D*
"C"
"B"
0.2
0.9
0.4
0.7
3.0
2.9
1.3 D*
1.6 D*
9
Plane A

Plane B Is Parallel to Plane A.
The Entire Coil Body at Design Volts (12.8) Must Be Contained Within the Volume as Specified. The End of the First Turn of the Coil Must Lie Within Volume "B" and The End of the Last Turn of the Coil Must Lie Within Volume "C".
Line A Is Perpendicular to Plane A and Concentric with the 17.46 MM Diameter of the Base.

*D = Diameter of Filament Coil

Dimensions Shown Are in Millimetres

Figure 19-5 - Specifications for the Type HB3 Standardized Replaceable Light Source



(Also see continuation page)

Figure 20 - Specifications for the Type HB4 Standardized Replaceable Light Source

Dimension	Inches	Millimetres
AA	0.591 Max / 0.217 Min	15.00 Max / 5.50 Min
AB	0.236	6.00
AC	45°	45°
AD	0.079	2.00
AE	1.09	27.8
AF	0.165	4.20
AG	0.346	8.80
AH	0.433	11.00
AI	0.055	1.40
AJ	0.217 ± 0.006	5.50 ± 0.15
AK	0.06	1.5
AL	0.780 Dia	19.81 Dia
AM	2.165	55.00
AN	0.093	2.36
AO	0.157	4.00
AP	45° Chamfer	45° Chamfer
AQ	0.039	1.00
AR	$0.766 {}^{+0.004}_{-0.000}$ Dia	$19.46 {}^{+0.10}_{-0.00}$ Dia
AS	0.866 ± 0.002 Dia	22.00 ± 0.05 Dia
AT	0.079	2.00
AU	0.138	3.5
AV	0.209 Min	5.30 Min
AW	0.378	9.60

1 Dimensions Shown Are Maximum-May Be Smaller

2 Bulbs Must Be Equipped With a Seal. The Bulb-Seal Assembly Must Withstand a Minimum of 69kPA. (10 P.S.I.G.) When the Assembly Is Inserted into a Cylindrical Aperture of 22.22 ± 0.10 MM (0.875 ± 0.004 IN).

3 See Figure 20-5

4 Diameters Must Be Concentric Within 0.20 MM (0.008 IN).

5 Glass Bulb Periphery Must Be Optically Distortion Free Axially Within the Included Angles About Point B.

6 Key and Keyway Are Optional Construction. Keyway Required for Aftermarket Only.

7 Measured at Terminal Base. Terminals Must Be Perpendicular to Base and Parallel Within ±1.5°.

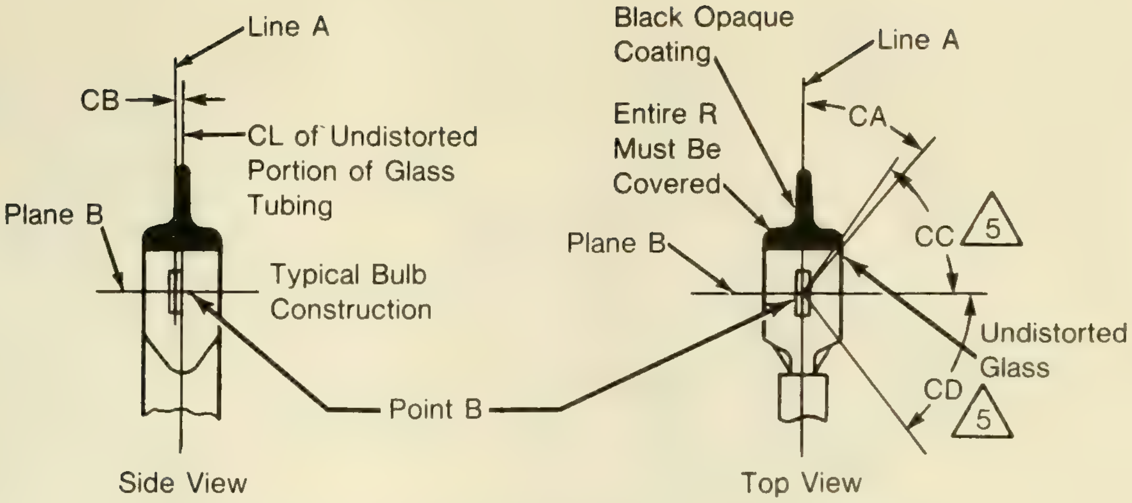
8 Diameters Must Be Concentric Within 0.20 MM (0.008 IN).

9 Absolute Dimension, No Tolerance.

10 Glass Capsule and Supports Shall Not Exceed This Envelope

Tolerances Unless Otherwise Specified	
Inches	Millimetres
2 Place Decimals ± .02	1 Place Decimals ± 0.5
3 Place Decimals ± .010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 20 - (Continued) Specifications for the Type HB4 Standardized Replaceable Light Source



Point B Is Intersection of Plane B and Centerline of Undistorted Glass Tubing

Dimension	Inches	Millimetres
CA	45° ± 5°	45° ± 5°
CB	0.030 ± 0.020	0.75 ± 0.50
CC	50° Min	50° Min
CD	52° Min	52° Min

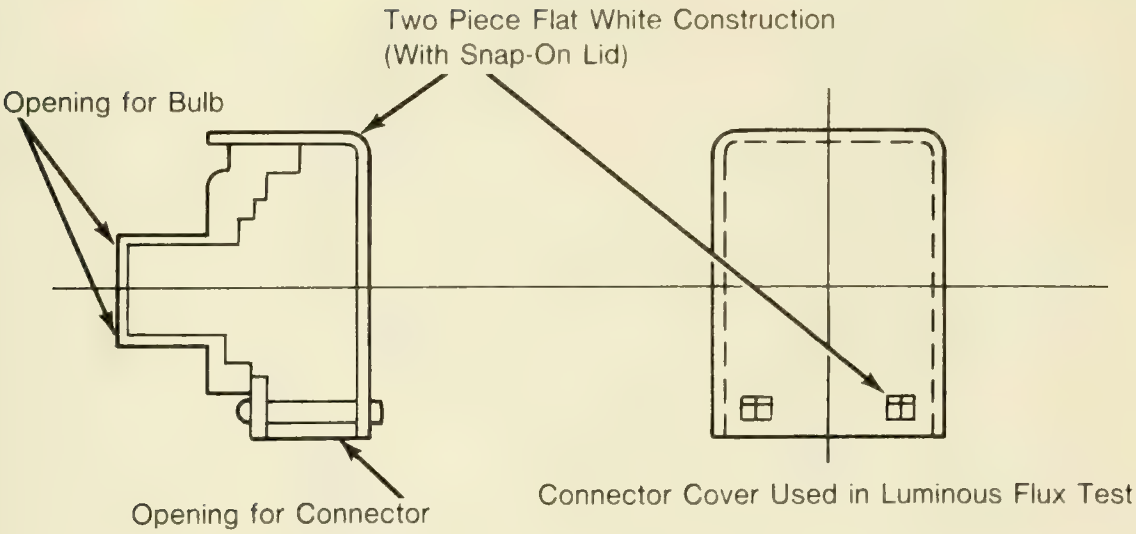
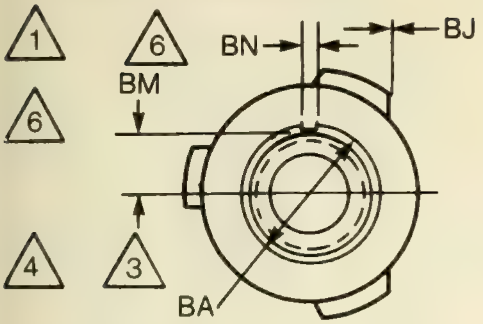
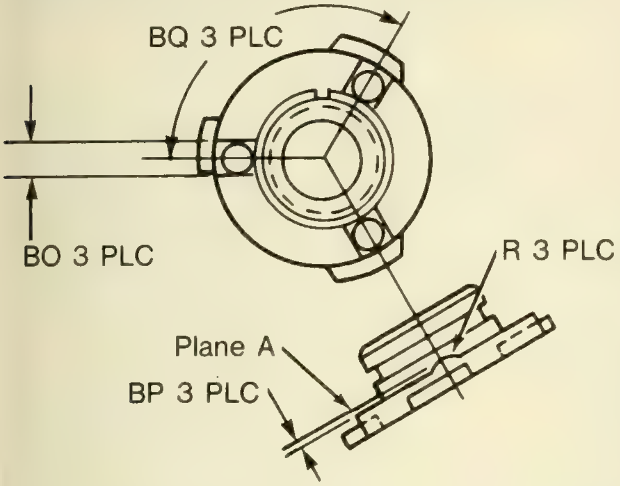

Two Piece Flat White Construction (With Snap-On Lid)
Opening for Bulb
Opening for Connector
Connector Cover Used in Luminous Flux Test

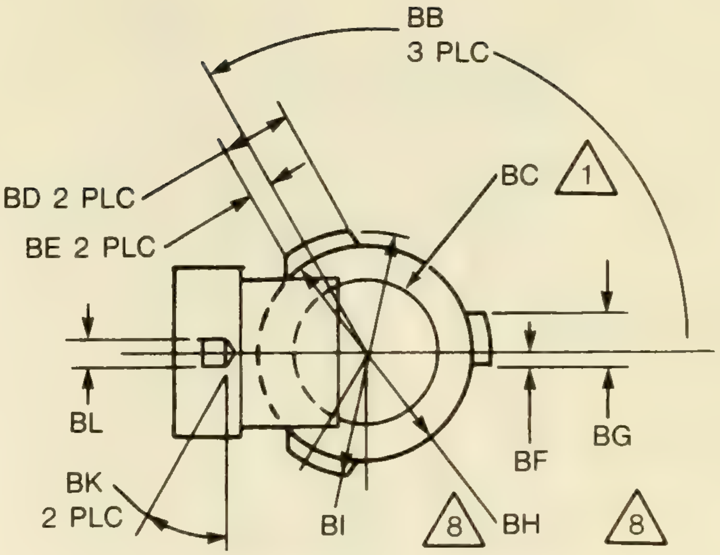
Figure 20-1 - Specifications for the Type HB4 Standardized Replaceable Light Source

View Y: from Bulb End



Optional Construction (View Y: from Bulb End)



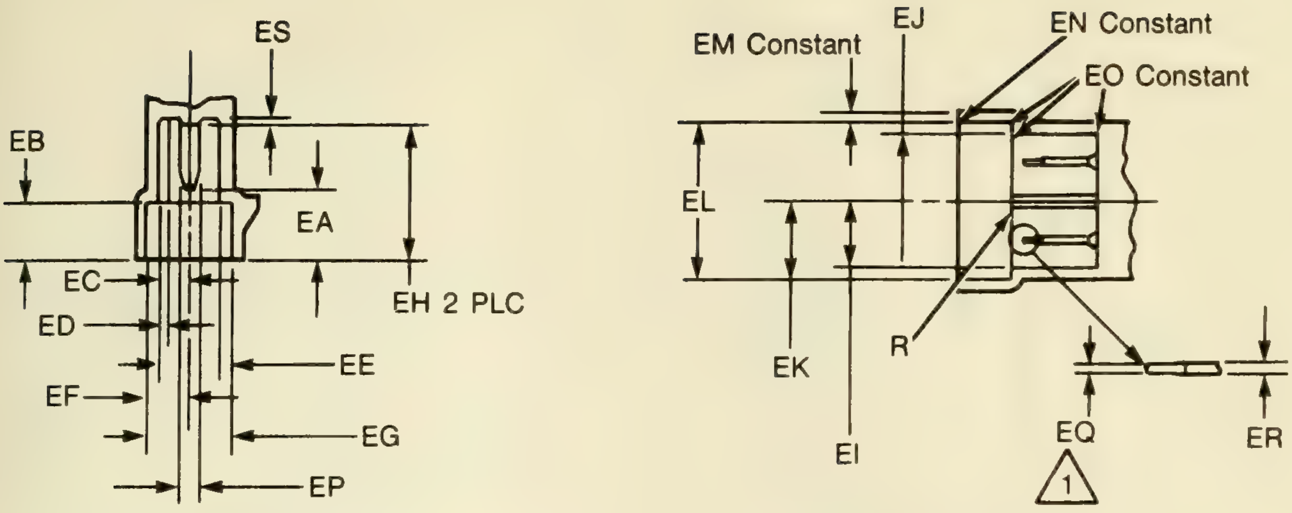


View Z: from Connector End

Tolerances Unless Otherwise Specified	
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Dimensions	Inches	Millimetres
BA	0.866 ±0.002 Dia	22.00 ±0.05 Dia
BB	120°±0°30	120°±0°30
BC	0.866 Dia	22.00 Dia
BD	0.394	10.00
BE	0.118	3.00
BF	0.079	2.00
BG	0.315	8.00
BH	1.181 Dia	30.00 Dia
BI	1.417 Dia	36.00 Dia
BJ	3°	3°
BK	30°	30°
BL	0.157	4.00
BM	0.39	9.9
BN	0.079 ±0.004	2.00 ±0.10
BO	0.20	5.0
BP	0.030	0.75
BQ	120° Typ	120° Typ

Figure 20-2 - Specifications for the Type HB4 Standardized Replaceable Light Source



Section S-S (from Fig 20)

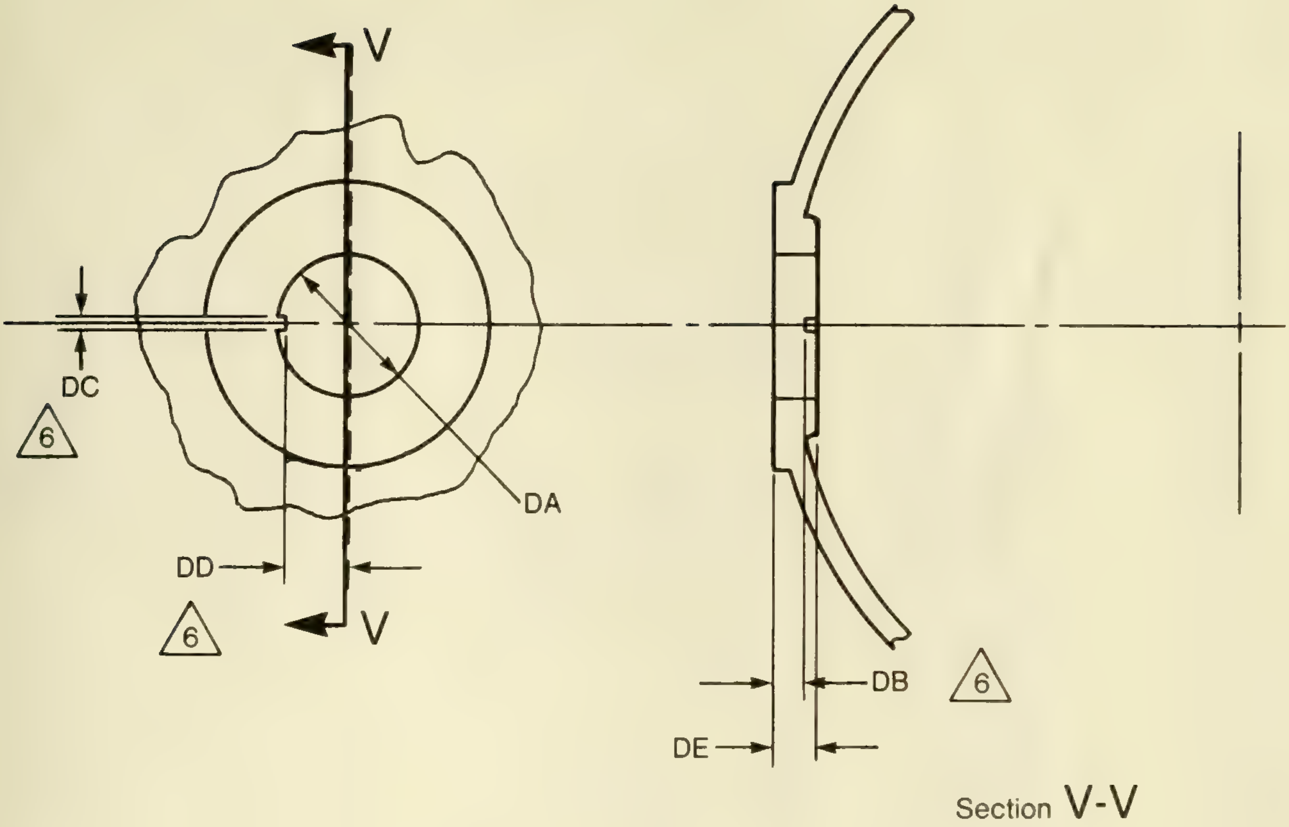
Section R-R (From Fig 20)

Dimensions	Inches	Millimetres
EA	0.384	9.75
EB	0.315	8.00
EC	0.171	4.35
ED	0.079	2.00
EE	0.343	8.70
EF	0.242 ±0.006	6.15 ±0.15
EG	0.484	12.30
EH	0.748	19.00
EI	0.368 ±0.006	9.35 ±0.15
EJ	0.736	18.70
EK	0.439 ±0.006	11.15 ±0.15
EL	0.878	22.30
EM	0.059	1.50
EN	0.03 R	0.8 R
EO	0.016 R	0.40 R
EP	0.110 ±0.004	2.8 ±0.10)
EQ	0.024	0.60
ER	0.033 ±0.001	0.83 ±0.03
ES	0.039 Min	1.00 Min

Tolerances Unless Otherwise Specified

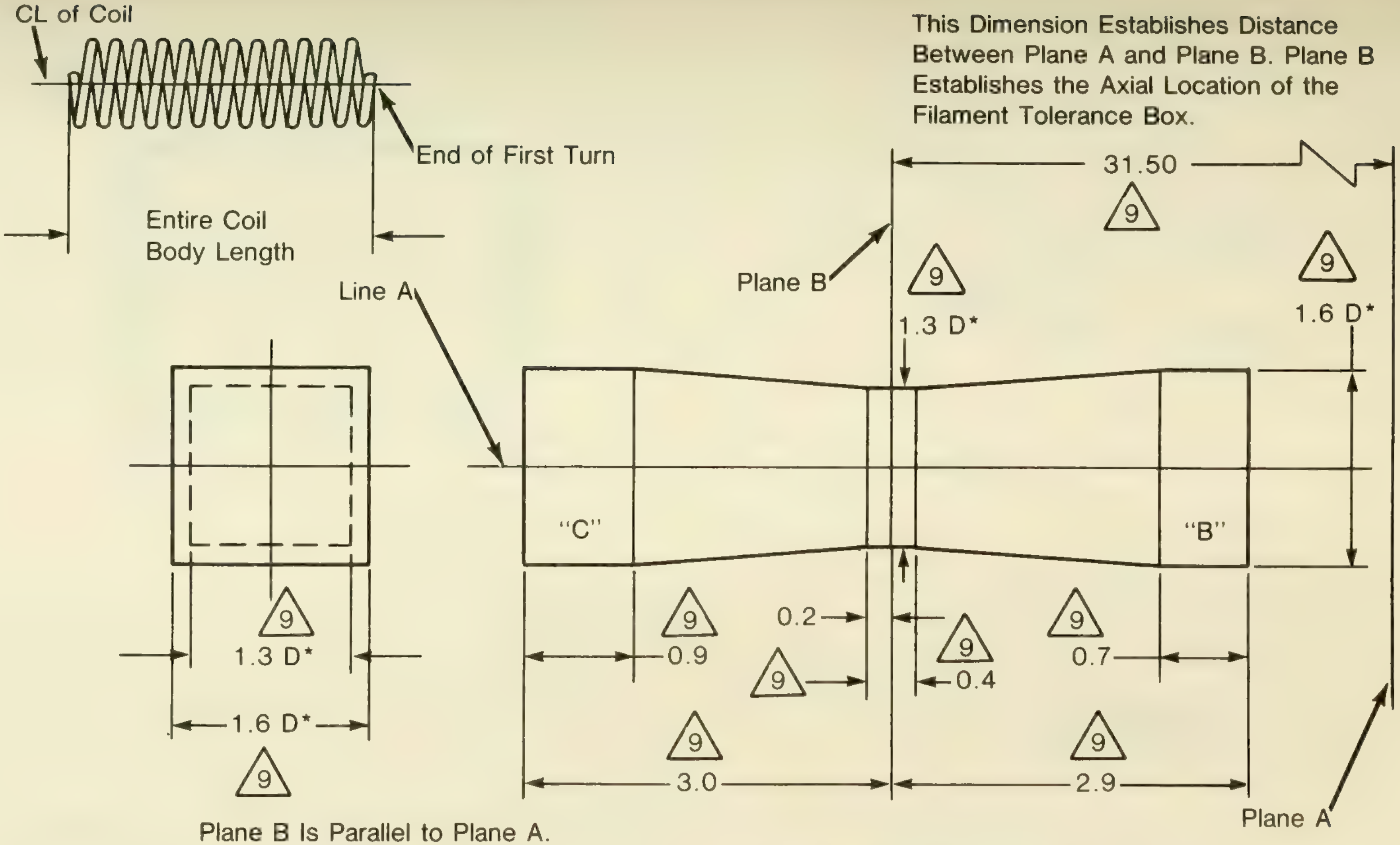
Inches	Millimetres
2 Place Decimals ± 0.02	1 Place Decimals ± 0.5
3 Place Decimals ± 0.010	2 Place Decimals ± 0.30
Angular ± 1°	Angular ± 1°

Figure 20-3 - Specifications for the Type HB4 Standardized Replaceable Light Source



Dimensions	Inches	Millimetres
DA	0.875 ±0.004 Dia	22.22 ±0.10 Dia
DB	$0.172\ ^{+0.010}_{-0.000}$	$4.36\ ^{+0.30}_{-0.00}$
DC	0.067 ±0.004	1.70 ±0.10
DD	$0.392\ ^{+0.004}_{-0.000}$	$9.95\ ^{+0.10}_{-0.00}$
DE	0.236 Min	6.00 Min

Figure 20-4 - Specifications for the Type HB4 Standardized Replaceable Light Source Socket (in Reflector)


This Dimension Establishes Distance Between Plane A and Plane B. Plane B Establishes the Axial Location of the Filament Tolerance Box.

Plane B Is Parallel to Plane A.

The Entire Coil Body at Design Volts (12.8) Must Be Contained Within the Volume as Specified. The End of the First Turn of the Coil Must Lie Within Volume "B" and the End of the Last Turn of the Coil Must Lie Within Volume "C". Line A Is Perpendicular to Plane A and Concentric with the 19.46 MM Diameter of the Base.

*D = Diameter of Filament Coil

Dimensions Shown Are in Millimetres

Figure 20-5 - Specifications for the Type HB4 Standardization Replaceable Light Source

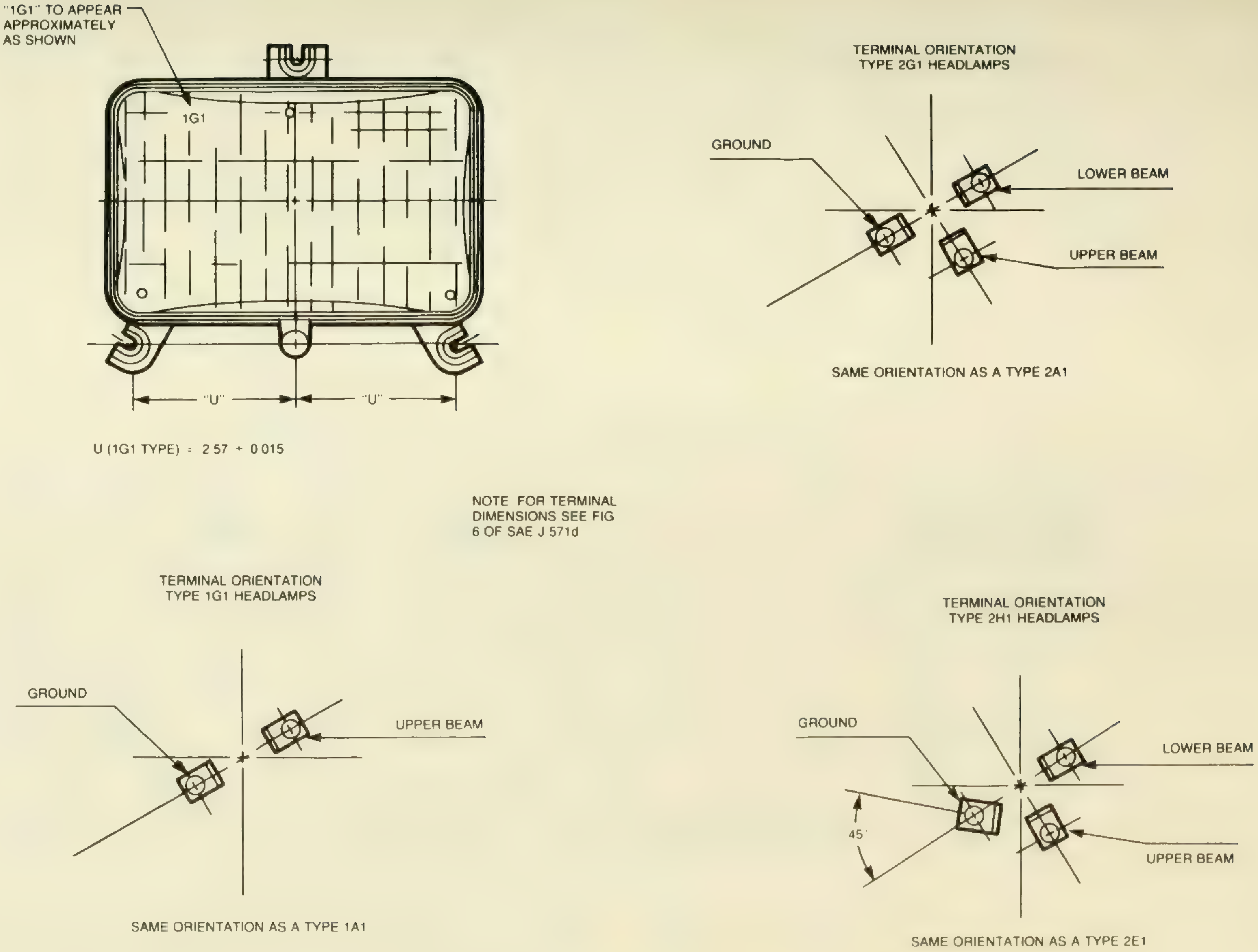
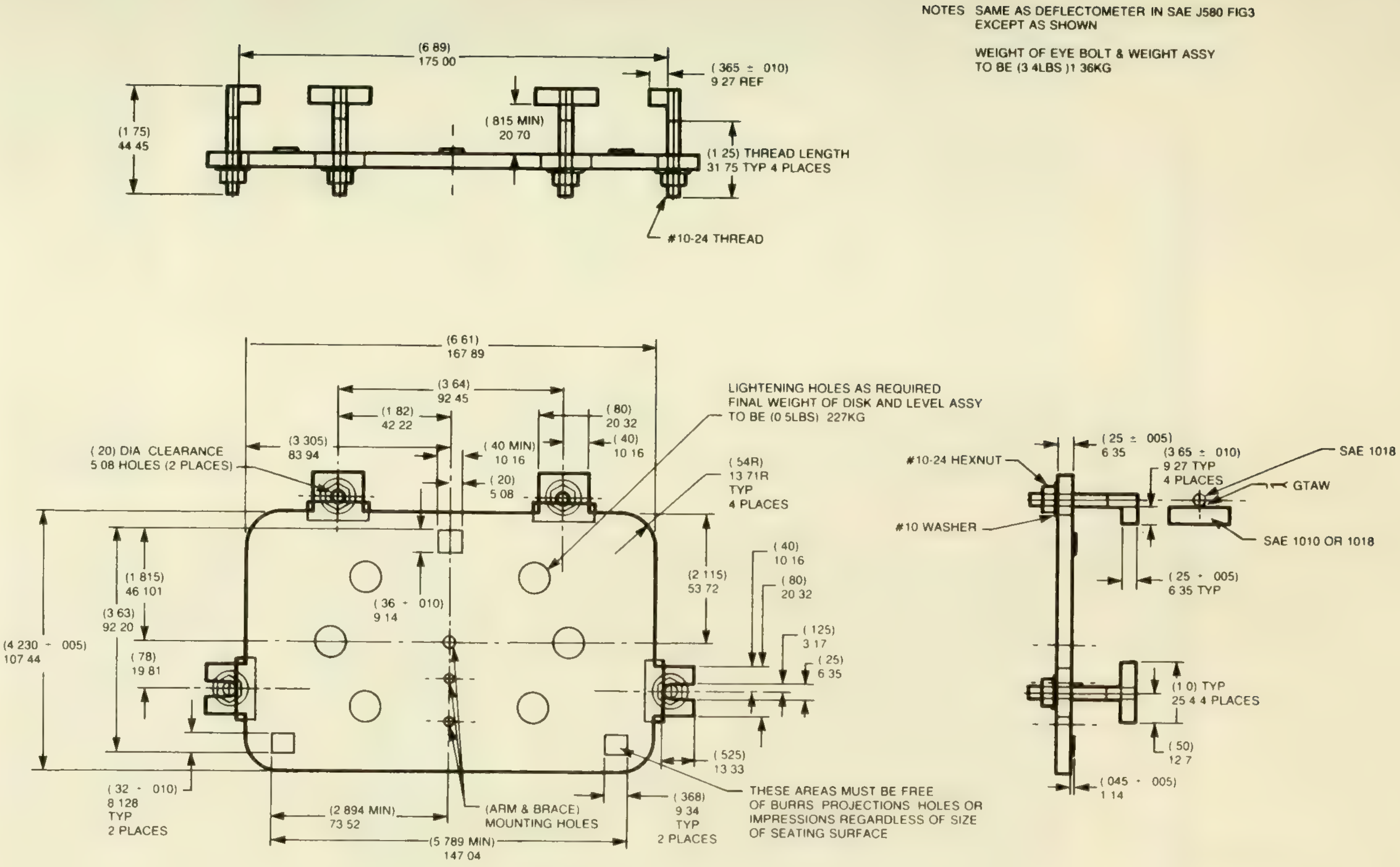


Figure 21 — Non-Interchangeability Configurations for Integral Mount Sealed Beam Headlamps, Types G and H


NOTES SAME AS DEFLECTOMETER IN SAE J580 FIG3 EXCEPT AS SHOWN

WEIGHT OF EYE BOLT & WEIGHT ASSY TO BE (3 4LBS)1 36KG

Figure 22 — Deflectometer Adaptor for Torque Deflection Tests on Type G and H Headlamp Systems

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 18)

A proposal to amend § 371.21 of Part 371, Initial Federal Motor Vehicle Safety Standards, by adding Standard No. 109, New Pneumatic Tires—Passenger Cars; and Standard No. 110, Tire Selection and Rims—Passenger Cars; was published in the *Federal Register* on July 22, 1967 (32 F.R. 10812).

Interested persons have been afforded an opportunity to participate in the making of the amendment.

Compliance with the labeling requirements of Standard No. 109, established in accordance with section 201 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1421), and the tread wear indicator requirements found in the standard may necessitate the modification of tire molds. Several tire manufacturers requested that additional time be allowed to modify these tire molds. After evaluation of all data received, it was determined that an effective date of August 1, 1968, for paragraphs S4.2.1 and S4.3 would provide a reasonable amount of time to accomplish the necessary mold modifications.

Many comments stated that no practical way is known to permanently affix a label onto the tire sidewall, as would have been required by proposed paragraph S4.3.1 until such time as a label is molded into or onto the tire. Accordingly, S4.3.1 of Standard No. 109 has been modified to permit, until August 1, 1968, the use of a label or tag containing the required labeling information not permanently molded into or onto the tire.

Many comments objected to the limitations imposed by the maximum tire section width dimensions specified in the tables of the notice. The Administrator has determined that additional dimensional latitude is necessary, and therefore Standard No. 109 specifies that to provide for tire growth, protective side ribs, ornamentation, manufacturing tolerances, and design differences for each tire size designation, actual tire section width and overall tire width may exceed the section width specified in Table I of the Standard by 7 percent.

In response to requests, additional tire size designations and load/inflation schedules were added when necessary information was available. In addition, Table I of Standard No. 109 and Table II of Standard No. 110 have been combined to collate related information.

Persons desiring an amendment to Standard No. 109 adding tires not presently listed, should submit sufficient pertinent information relative to these tires in 10 copies to the Secretary of Transportation; Attention: Motor Vehicle Safety Performance Service, National Highway Safety Bureau, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. 20591.

Data received have shown that the rim references indicated in the proposed Standards were inadequate in coverage. Therefore, a more comprehensive list of foreign and domestic trade association publications containing appropriate rim standards or practices has been referenced in the Standards.

Data received demonstrated that the bead unseating and tire strength requirements were inappropriate for certain groups of small tires. Accordingly, tires were regrouped and the test values revised to provide requirements for these small tires that are proportional to the requirements for other sizes of tires.

Although Standard No. 109 applies to tires for use on passenger cars manufactured after 1948, some of the tires covered by the Standard may also be used on earlier model vehicles.

The testing procedures set forth in the Standard, size designations, and related data are based upon existing standards or practices using information furnished by such organizations as the Society of Automotive Engineers, Federal Trade Commission, Tire and Rim Association, European Tire and Rim Technical Organization, Japanese Standards Association, Japan Automobile Tire Manufacturers Association, Rubber Manufacturers Association, Tyre Manufacturers Conference, Ltd., and the Society of Motor Manufacturers and Traders, Ltd.

To permit production of sufficient quantities of tires complying with the requirements of Standard No. 109 after its effective date of January 1, 1968, Standard No. 110 applies to passenger cars manufactured on or after April 1, 1968.

A single table of load/pressure values for radial ply tires was included in the notice and this was supported by many comments. Other comments stressed the importance of including different load/pressure values for optimum tire deflections. Although a single table of load/pressure schedules combining these values for these radial ply tires would be desirable, it was not considered advisable to include such a table in the standard promulgated under the present notice.

In accordance with section 201 of the Act, S4.3 of Standard No. 109 requires that each tire be labeled with the name of the manufacturer or his brand name and an approved code mark to permit the tire seller to identify the tire manufacturer upon the purchaser's request. Any tire manufacturer desiring an approved code mark should apply for his code number assignment to the Secretary of Transportation; Attention: Motor Vehicle Safety Performance Service, National Highway Safety Bureau, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. 20591.

Several comments, including the suggested use of a "load range" system, will be considered for future rulemaking. (See 32 F.R. 14279).

Since it was clearly the intent of the Congress that, to enhance the safety of the general public, Federal Motor Vehicle Safety Standards for tires become effective as soon as practicable, and since no adverse comments were received pertinent to the proposed effective date presented in the advance notice of proposed rulemaking (32 F.R. 2417), at a Government-industry technical meeting, and in the notice of proposed rulemaking (32 F.R. 10812), and no undue burden was demonstrated, good cause is shown that an effective date earlier than 180 days after issuance is in the public interest.

In consideration of the foregoing, § 371.21 of Part 371, Initial Federal Motor Vehicle Safety Standards, is amended . . . . Standard No. 109 becomes effective January 1, 1968, and Standard No. 110 becomes effective April 1, 1968.

(Secs 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of Mar. 31, 1967 (32 F.R. 5606), as amended Apr. 6, 1967 (32 F.R. 6495), July 27, 1967 (32 F.R. 11276), Oct. 11, 1967 (32 F.R. 14277), Nov. 8, 1967).

Issued in Washington, D.C., on November 8, 1967.

Lowell K. Bridwell,
Federal Highway Administrator.

32 F.R. 15792
November 16, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 18)

Motor Vehicle Safety Standard No. 109 (32 F.R. 15792) specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires for use on passenger cars manufactured after 1948.

Certain labeling requirements are set forth in S4.3, including, in paragraph (i), a requirement for an approved recital (or the symbol specified in Figure 1) that the tire conforms to applicable Federal Motor Vehicle Safety Standards. Figure 1 contains lettering detail dimensions for that symbol.

The Federal Highway Administration has determined that it is not necessary to specify the width and stroke of individual letters nor the space between letters if the overall length and height is specified, and that more latitude is needed in the depth and overall length requirements for this symbol. Therefore, Standard No. 109 is being amended by striking out the unneeded dimensions and by providing increased latitude for the letter depth and the overall length requirements.

Since this amendment provides an alternative means of compliance, relieves a restriction, and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and good cause is shown that an effective date earlier than 180 days after issuance is in the public interest and the amendment may be made effective less than 30 days after publication in the *Federal Register*.

In consideration of the foregoing, § 371.21 of Part 371, Initial Federal Motor Vehicle Safety Standards, Standard No. 109 is amended by deleting Figure 1 (32 F.R. 15794) and in its place inserting the following Figure 1.

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of Mar. 31, 1967 (32 F.R. 6506), as amended Apr. 6, 1967 (32 F.R. 6495), July 27, 1967 (32 F.R. 11276), Oct. 11, 1967 (32 F.R. 14277), and Nov. 8, 1967 (32 F.R. 15710))

This amendment becomes effective January 1, 1968.

Issued in Washington, D.C., on December 11, 1967.

Lowell K. Bridwell,
Federal Highway Administrator.

33 F.R. 17938
December 15, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 18R)

Motor Vehicle Safety Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938), specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance, and high speed performanace; defines tire load ratings; and specifies labeling requirements for new pneumatic tires for use on passenger cars manufactured after 1948. Motor Vehicle Safety Standard No. 110 (32 F.R. 15798) specifies tire selection and rims requirements to prevent tire overloading.

Figures 2 and 3 of Standard No. 109 are drawings of the bead unseating test fixture used in performing the test specified in S5.2.

Section S5.4.2.3 specifies the 50 miles-per-hour test schedule for the tire endurance test.

Tables I–A through I–H list the various tire types and sizes with proper load and inflation values.

After review of Petitions for Reconsideration received under Docket No. 18R, the Administrator has determined that certain parts of Standard No. 109 require clarification, the tire tables need revision to include a number of new sizes and there is need for a table listing a new series of tires.

In addition, Standard No. 110 requires an additional table to list alternative rims for tire and rim combinations not presently covered by the standard.

Therefore, Standard No. 109 is being amended by—

(a) Revising Figures 2 and 3, which depict the bead unseating test fixture, by adding one additional dimension to Figure 2 and a centerline and tangent line to Figure 3;

(b) Specifying that the test required by S5.4.2.3 be conducted without pressure adjustment or other interruption;

(c) In table I–A through I–H

(1) Adding additional tire size designations;

(2) Adding footnotes permitting the use of the letter "H", "S", or "V";

(3) Correcting typographical errors;

(d) Adding Table I–J which lists a new series of low section height tires.

In addition, Standard No. 110 is being amended by—

(a) Revising paragraph S4.4.1 to include alternative rims, not presently listed in the references cited in the definition of Test Rim in S3 of Standard No. 109; and

(b) Adding a new table of approved alternative rims.

Since these amendments provide clarification and alternative means of compliance, relieve restrictions, and impose no additional burden on any person, notice and public procedure hereon are unnecessary. The Administrator finds, for good cause shown, that no preparatory period is needed to effect compliance and it is therefore in the public interest to make the amendments effective immediately.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938), and Standard No. 110 (32 F.R. 15798), are amended, effective April 11, 1968 . . . .

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of March 31, 1967 (32 F.R. 5606), as amended Nov. 8, 1967 (32 F.R. 15710)).

Issued in Washington, D.C., on April 11, 1968.

Lowell K. Bridwell,
Federal Highway Administrator.

33 F.R. 5944
April 18, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

On September 11, 1968, the Federal Highway Administration published in the *Federal Register* amendments to Standard Nos. 109 and 110 (33 F.R. 12842). Omitted from publication as part of Appendix A of Standard No. 109 were Tables 1–A through 1–J. For the convenience of persons using the tables the preamble to the amendments published September 11, 1968, and the text of the amendments, as corrected by the addition of the omitted tables are published below. Additionally, Appendix A of Standard No. 110 has been changed to specify the information that should be submitted with requests for the addition of alternative rim sizes.

Federal Motor Vehicle Safety Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938 and 33 F.R. 5944), specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires for use on passenger cars manufactured after 1948. Motor Vehicle Safety Standard No. 110 (32 F.R. 15798) as amended (33 F.R. 5949) specifies tire selection and rim requirements to prevent tire overloading.

Tables 1–A through 1–J of Standard No. 109 list various tire types and sizes with proper load and inflation values.

Standard No. 109 is being amended to designate Tables 1–A through 1–J as Appendix A of Standard No. 109.

In addition, Table 1–H is being amended by adding additional tire size designations.

Table I of Standard No. 110 is a list of alternative rims for tire and rim combinations that are not contained in any reference in § 3 of Standard No. 109.

Standard No. 110 is being amended to designate Table I as Appendix A of Standard No. 110.

In addition, the table is being amended by adding, as alternative rims for tire size 8.55x15, rim sizes 5½–JK, 5½–JJ, 5½–J; F70–14, rim size 7JJ; and G70–14, rim size 7JJ.

Additionally, guidelines by which persons requesting routine additions to Appendix A of Standard No. 109 and Appendix A of Standard No. 110, are set forth as introductory language to both appendices. The guidelines provide an abbreviated rule making procedure for adding tire sizes to Standard No. 109, whereby the addition becomes effective 30 days from date of publication in the *Federal Register* if no comments are received. If comments objecting to the amendment warrant, the Administration will provide for additional rule making pursuant to the Rule Making Procedures for Motor Vehicle Safety Standards (23 C.F.R. 216).

Since these amendments provide an alternative means of compliance, relieve restrictions, and impose no additional burdens on any person, notice and public procedure hereon are unnecessary and the Administrator finds, for good cause shown, that no preparatory period is needed to effect compliance and it is in the public interest to make the amendments effective immediately.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standards, Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938 and 33 F.R. 5944), and Standard No. 110 (32 F.R. 15798), as amended (33 F.R. 5949), are amended effective this date as set forth below.

These amendments are made under the authority of Sections 103 and 119 of the National

Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation from the Secretary of Transportation, Part I of the Regulations of the Office of the Secretary (49 C.F.R. § 1.4(c)).

Issued in Washington, D.C., on September 27, 1968.

John R. Jamieson, Deputy
Federal Highway Administrator

33 F.R. 14964
October 5, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 69–4; Notice No. 1)

On October 5, 1968, the Federal Highway Administration published guidelines in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A of Standard No. 109 and the Appendix A of Standard No. 110. These guidelines provided an abbreviated rule-making procedure for adding tire sizes to Standard No. 109 and alternative rim sizes to Standard No. 110, whereby the addition becomes effective 30 days from date of publication in the *Federal Register* if no objections to the proposed additions are received. If comments objecting to the amendment warrant, rule making pursuant to the rule-making procedures for motor vehicle safety standards (49 CFR Part 353) will be followed.

The Rubber Manufacturers Association has petitioned for the addition of the C70–15 tire size designation to Table I–B and the F60–15 tire size designation as a new category of tire to be listed within the tables. The Firestone Tire & Rubber Company has petitioned for the addition of the E50C–16, F50C–16, and H50C–17 tire size designations as a new category of tires.

On the basis of the data submitted by the Rubber Manufacturers Association and the Firestone Tire & Rubber Company indicating compliance with the requirements of Federal Motor Vehicle Safety Standards Nos. 109 and 110 and other information submitted in accordance with the procedural guidelines set forth. Appendix A of Motor Vehicle Safety Standard No. 109 is being amended and Table I of Appendix A of Standard No. 110 is being amended.

In consideration of the foregoing, § 371.21 of Part 371 Federal Motor Vehicle Safety Standards, Appendix A of Standard No. 109 (33 F.R. 14964) and Appendix A of Standard No. 110 (33 F.R. 14969) are amended as set forth below effective 30 days from date of publication in the *Federal Register.*

These amendments are issued under the delegation of authority published October 5, 1968 (33 F.R. 14964) and sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation from the Secretary of Transportation, Part I of the Regulations of the Office of the Secretary (49 CFR 1.4(c)).

Issued on February 3, 1969.

H. M. Jacklin, Jr.
Acting Director
Motor Vehicle Safety
Performance Service
National Highway Safety Bureau

Motor Vehicle Safety Standard No. 109

(1) Table I–B of Appendix A is amended by inserting between the tire size designation L70–14 and D70–15 . . . new tire size C70–15 data.

(2) . . . Tables I–K and I–L are added to Appendix A listing new categories of tire size designations.

34 F.R. 1908
February 8, 1969

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 69-3; Notice No. 1)

The Rubber Manufacturers Association has submitted a petition for rulemaking requesting amendments to Table I-A and Table I-B of Appendix A of Federal Motor Vehicle Safety Standard No. 109—New Pneumatic Tires—Passenger Cars.

The petition requests the following changes:

(1) In Table I-A for tire size designation 8.25-15 the minimum size factor be changed from 37.57 inches to 35.57 inches.

(2) In Table I-B for tire size designation D70-13 the minimum size factor be changed from 32.32 inches to 32.34 inches; for tire size designation D70-14 the minimum size factor be changed from 32.87 inches to 32.81 inches; for tire size designation F70-14 the minimum size factor be changed from 34.18 inches to 34.16 inches; for tire size designation G70-14 the minimum size factor be changed from 35.14 inches to 35.18 inches; for tire size designation J70-14 the minimum size factor be changed from 36.91 inches to 36.87 inches; for tire size designation L70-14 the minimum size factor be changed from 37.59 to 37.62 and the section width be changed from 9.80 inches to 9.75 inches; for tire size designation D70-15 the minimum size factor be changed from 33.34 inches to 33.37 inches and the section width be changed from 7.75 inches to 7.70 inches; for tire size designation E70-15 the minimum size factor be changed from 34.17 inches to 34.13 inches; for tire size designation F70-15 the minimum size factor be changed from 34.91 inches to 34.89 inches; for tire size designation G70-15 the minimum size factor be changed from 35.68 inches to 35.66 inches; for tire size designation H70-15 the minimum size factor be changed from 36.68 inches to 36.64 inches; for tire size designation J70-15 the minimum size factor be changed from 37.34 inches to 37.36 inches; and for tire size designation K70-15 the minimum size factor be changed from 37.62 inches to 37.66 inches.

RMA states in its petition that the requested changes are either (1) corrections of typographical errors in material submitted earlier by the RMA, upon which the present tables found in Appendix A of Standard No. 109 are based; or (2) slight modifications that reflect the most recently calculated data.

The request changes are being made. However, should any comments be received from interested persons objecting to, and giving reasons why the changes should not be made, the amendment will be modified as considered appropriate.

Since, to the extent they are other than corrective, these amendments make only minor technical changes at the request of the affected industry, the Administrator finds that, for good cause, notice of public procedure thereon is impracticable and unnecessary. Interested persons may submit written data, views, or arguments relating to the amendments. Comments should identify the Docket (No. 69-3) and be submitted in an original and three copies to the National Highway Safety Bureau, Rules Docket, Room 512, Federal Highway Administration, Washington, D.C. 20591. All comments submitted will be available for examination by interested persons at the docket room.

In consideration of the foregoing, section 371.21 of Part 371 (formally section 255.21 of Part 255), Tables I-A and I-B of Appendix A of Federal Motor Vehicle Safety Standard No. 109 as amended (33 F.R. 19714) is amended effective March 15, 1969 . . . . (Secs. 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966; (15 U.S.C. 1392, 1407); and the delegation of authority contained in § 1.4(c) of

Part I of the Regulations of the Office of the Secretary (49 CFR 1.4 (c)).

Issued in Washington, D.C. on February 10, 1969.

John R. Jamieson, Deputy
Federal Highway Administrator

34 F.R. 2252
February 15, 1969

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 69–12; Notice No. 2)

A proposal to amend Part 571 (formerly Part 371), Federal Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires—Passenger Cars" was published on July 11, 1969 (34 F.R. 11501), as a notice of proposed rule making to delete the exemption for deep-tread, winter-type tires contained in the high-speed requirements. Interested persons were invited to submit comments to this notice.

Federal Motor Vehicle Safety Standard No. 109 (49 CFR 571.21), as amended (33 F.R. 19711), specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance and high-speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires for use on passenger cars manufactured after 1948.

Paragraph S5.5.4 of Standard No. 109 specifies that for the high-speed performance aspects of the standard, tires are to be tested at 75 m.p.h. for 30 minutes, 80 m.p.h. for 30 minutes, and (except for deep-tread, winter-types tires) 85 m.p.h. for 30 minutes.

Because, in actual practice, deep-tread, winter-type tires are often required to perform at the same rate of speed as other type passenger car tires it was considered in the public interest to amend S5.5.4 to require the same level of high-speed performance of deep-tread, winter-type tires as other type tires are required to meet.

Several comments, including comments from one association representing new tire manufacturing companies, stated that the deep-tread, winter-type tires had groove depths deeper than conventionally treaded tires and that shoulder temperatures of the tires on the laboratory test wheel operating at 80 m.p.h. are comparable to actual highway speeds in excess of 100 m.p.h. These commentators also indicated that to comply with the proposed amendment, the tread depths and lug configurations for the deep-tread, winter-type tires would have to be redesigned. However, research conducted for the Bureau has indicated that all deep-tread, winter-type tires when properly designed and constructed will conform to the present high-speed requirements for conventionally treaded passenger car tires. In addition, test wheel data submitted show that although the temperature of the crown of the tire of deep-tread, winter-type tires may run higher during the high-speed wheel test the difference in shoulder temperature appears insignificant.

Since deep-tread, winter-type tires must often perform at the same motor vehicle speeds and driving conditions as conventionally treaded tires, it is in the public interest that they meet the same minimum performance levels.

In consideration of the above, Federal Motor Vehicle Safety Standard No. 109 paragraph S5.5.4 is amended . . . .

This amendment becomes effective January 1, 1971.

Issued on July 8, 1970.

Douglas W. Toms,
Director,
National Highway Safety Bureau

35 F.R. 11241
July 14, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 70-2; Notice No. 2)

A proposal to amend Federal Motor Vehicle Safety Standard 109, New Pneumatic Tires—Passenger Cars, 49 CFR Part 571, was published on April 22, 1970 (35 F.R. 6440). The purpose of the proposed rule was to prevent the sale of tires that failed to pass the passenger car tire standard Motor Vehicle Safety (Standard No. 109) but were nevertheless being sold for passenger car use. As indicated in the notice of the proposed rule, Bureau investigations disclose that this has been a widespread practice. The use of such tires on passenger cars is considered a safety hazard.

In spite of the notice and press releases on the subject, the Bureau has found that unscrupulous distributors and dealers are continuing to buff off restrictive labeling on the tires and are selling them to unsuspecting members of the public. This amendment is therefore necessary to control the relatively large number of tires being reclassified and to provide a better means of enforcing the regulation against persons who are selling these tires for passenger car use.

The amendment changes the passenger car tire standard to require tires that are not certified by the manufacturer as complying with the passenger car tire standard to be branded with the phrase "Unsafe for Highway Use" and to have a label attached indicating that sale of the tire for passenger car use subjects the person selling the tire to a $1,000 civil penalty. The amendment also requires tire manufacturers to report to the Bureau periodically on the number of these tires sold and the names of distributors or dealers to whom they are sold.

Interested persons have been offered an opportunity to participate in the making of this amendment. It was almost unanimously agreed that there should be some restrictions placed on tires that had not been certified as complying with Standard No. 109. Several comments to the notice objected, however, to the requirement that the phrase "Unsafe for Normal Highway Use" be on the tire, on the ground that the word "Normal" was ambiguous. This designation has been found to have merit, and the word "Normal" has been omitted from the required phrase.

The requirement that the phrase be superimposed upon the manufacturer's name, or brand name, with lettering three-quarters of an inch high was objected to because the phrase would not be legible and could be easily removed. To avoid these problems, the requirement has been changed to provide that the phrase "Unsafe for Highway Use" be placed between the maximum section width and the tread and the height of the lettering reduced to one-half inch.

The proposal that the lettering of the term signifying the tire was unsafe for highway use be one-sixteenth of an inch deep was objected to because some tire casings have less than one-sixteenth of an inch of rubber on the outside of the sidewall and the alternative of one-half the thickness of the rubber covering the outside ply was not meaningful because the thickness could not always be determined. However, it is essential that the lettering be deep enough so that any attempt to buff it off will be easily recognizable and, therefore, the requirement that the lettering be one-sixteenth of an inch deep is being maintained. The change from the proposal to allow the lettering to be located anywhere between the maximum section width and the tread will allow the manufacturer to select a location where the rubber thickness is sufficient to impress lettering one-sixteenth of an inch.

Some comments suggested that the words "tube" or "tubeless" be required on the tire, even though the tire would not be used for passenger cars. This suggestion has been adopted in the final rule.

The requirement that the maximum inflation pressure and the maximum load rating be on the tire was omitted because they pertain to tires manufactured for passenger car use, not tires for off-road usage.

Some comments objected to the requirement that manufacturers report the quantity and serial numbers of reclassified tires sold and the names of distributors and dealers who purchase them. It was argued that keeping track of serial numbers, and distributors or dealers the tires were sold to would be burdensome and serve no safety related purpose. The Bureau feels that reporting of reclassified tires that are unsafe for highway use will provide the necessary control over these reclassified tires to assure that the tires will not be sold for passenger car use. Therefore, the reporting requirements have been maintained.

In consideration of the foregoing, Title 49—Transportation, Chapter V—National Highway Safety Bureau, Department of Transportation, Subchapter A—Motor Vehicle Safety Regulations, Part 571—Federal Motor Vehicle Safety Standard No. 109, New Pneumatic Tires—Passenger Cars is amended.

Effective date: December 1, 1970.

Since this amendment is designed to prevent a practice which can endanger the lives and property of the general public and because no comments were received objecting to the proposed effective date of December 1, 1970, in the notice of proposed rulemaking, good cause is shown that an effective date earlier than 180 days after issuance is in the public interest.

Issued on October 22, 1970.

Douglas W. Toms,
Director

35 F.R. 16734
October 29, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–4; Notice No. 1)

Federal Motor Vehicle Safety Standard No. 109, 49 CFR Part 571, as amended (35 F.R. 16735), specifies requirements for passenger car tire dimensions and laboratory test requirements, defines tire load ratings, specifies labeling requirements and sets forth the limited conditions under which passenger car tires that are not certified as complying with the standard may be sold. One of the labeling requirements of the standard (S4.3(d)) is that each tire be labeled on both sidewalls with the manufacturer's name or, if the tire is a brand name tire, with the brand name and an approved code mark assigned the manufacturer by the National Highway Traffic Safety Administration (formerly the National Highway Safety Bureau). Another labeling requirement (S4.3(i)) in the standard is that each tire contain on both sidewalls a certification statement or the symbol DOT, constituting the manufacturer's certification that the tire conforms to the standard. Both of these requirements are affected by the Tire Identification and Recordkeeping Regulation (49 CFR Part 574), as revised and published in this issue of the *Federal Register* (36 F.R. 1196), in that the Tire Identification and Recordkeeping Regulation specifies the location of the DOT symbol and requires that it be on either sidewall of the tire. Part 574 also establishes a system whereby all tire manufacturers apply for an assigned two-symbol code designation which is to be part of the tire identification number and placed on either sidewall. It is intended that these requirements take the place of the requirements in Standard No. 109 that tire manufacturers be assigned a three-number code and that it be placed on both sidewalls of brand name tires.

In view of the above, S4.3 of the passenger car tire standard is amended as set forth below to reconcile the requirements of Standard No. 109 with the requirements of the Tire Identification and Recordkeeping Regulation.

In addition, the labeling requirements (S4.3) are changed as set forth below to make it clear that each tire shall be labeled with only one size designation found in the tables in Appendix A of Standard No. 109, except that tires may have equivalent inch and metric size designations. The labeling requirements are further changed by deleting the paragraph which deals with tires manufactured before August 1, 1968, since the exception is no longer relevant.

Requirements for reclassified tires (S6.) are being amended to provide that the serial number required by S6.1(c), and the manufacturer's code symbol, if used, can be on either sidewall.

It is further noted that the correction published in the *Federal Register* of November 26, 1970 (35 F.R. 18118), was inaccurately stated as "for the period covering November 1, 1970 through July 31, 1971". Actually, the phrase to be corrected was "for the period covering December 1, 1970 through July 31, 1971." S6.2 should read "for the period covering December 1, 1970 through June 30, 1971", and for clarity S6.2 is republished with the correct language.

In consideration of the foregoing, Standard No. 109 of § 571.21 of Title 49, Code of Federal Regulations, is amended.

Effective date: May 22, 1971.

Because this amendment to Standard No. 109 relieves restrictions, clarifies the intent expressed in the standard, makes a correction to the standard and imposes no additional burden on any person, notice and request for comments on such notice are found to be unnecessary and impracticable, and good cause is shown that an effective date earlier than 180 days after issuance is in the public interest.

Issued on January 19, 1971.

Douglas W. Toms,
Acting Administrator, National Highway Traffic Safety Administration

36 F.R. 1195
January 26, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–6; Notice 1)

On January 26, 1971, the National Highway Traffic Safety Administration (NHTSA) published in the *Federal Register* (36 F.R. 1196) a revision of Part 574, Tire Identification and Record Keeping (Docket No. 70–12; Notice No. 5) to become effective May 22, 1971. Part 574, as revised, provides that the DOT symbol, constituting the manufacturer's certification that the tire conforms with applicable motor vehicle safety standards, must be above, below, or to the left or right of the tire identification number. In addition, under this part the tire identification number must include, as the first grouping within the number, a two-symbol code assigned by the NHTSA that identifies the manufacturer of the tire. This notice amends Standard No. 109 of Part 571, in order to allow manufacturers, at their option, to convert to the new tire identification system before the May 22, 1971, effective date.

The requirements of Part 574 relating to the certification symbol and the manufacturer's code number will take the place of the requirements in Motor Vehicle Safety Standard No. 109, Part 571 of this chapter, that the tire manufacturers place the DOT symbol and an assigned three-digit code number (in the case of brand-name tires) on both sidewalls. Accordingly, a notice published January 26, 1971 (36 F.R. 1195), amends Standard No. 109, effective May 22, 1971, to reconcile the requirements of that standard with the requirements of the Tire Identification and Record Keeping Regulation.

The Administration has received requests that tires manufactured before May 22, 1971, the effective date of Part 574, that are marked as prescribed by that part, not be required to be labeled on both sidewalls with the DOT symbol and the manufacturer's three-digit code required by Standard No. 109.

The requests have been found reasonable. In order to avoid unnecessary costs and allow for a smoother transition to the new requirements, Standard No. 109 is by this notice amended to provide that tires manufactured from March 1, 1971 to May 22, 1971, shall either meet the requirements of § 574.5, or, on both sidewalls, contain the DOT symbol and the manufacturer's three-digit code number required by S4.3(d) and S4.3(i) of Standard No. 109. Thus, tires manufactured during this period may be marked according to the current system, the new one effective May 22, 1971, or both.

Because this amendment to Standard No. 109 relieves restrictions and imposes no additional burden on any person, it is found that notice and public procedure thereon are unnecessary and impracticable, and that, for good cause shown, an effective date earlier than 180 days after issuance is in the public interest.

Issued on February 26, 1971.

Douglas W. Toms,
Acting Administrator

36 F.R. 4290
March 4, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

Reclassified Tires

(Docket No. 70–2; Notice 4)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 109, to prohibit the manufacture and sale of passenger car tires that do not meet the performance requirements of the standard. Such tires are presently allowed to be sold as "reclassified tires." A notice proposing this action was published on November 27, 1971 (36 F.R. 22688).

Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," was amended October 29, 1970 (35 F.R. 16743), to allow passenger car tires which manufacturers did not certify as conforming to the performance tests of the standard, to be sold for off-highway purposes. The amendment required such tires to be labeled so that purchasers would be aware that they were considered unsafe for highway use. Moreover, manufacturers of such tires were required to report semi-annually to the NHTSA the number of tires sold. The purpose of the requirement was to allow the sale of such tires for off-highway purposes where a legitimate market existed for low-priced inexpensive tires, and where the fact that they failed to meet Federal performance tests would not pose a threat to users. Despite the conditions imposed by this amendment, the NHTSA continued to receive reports that significant numbers of these tires were being sold by unscrupulous dealers for passenger car, on-highway use.

Based upon its investigative efforts, and the material submitted to the docket in response to the notice of November 27, 1971, the NHTSA has determined that the continued sale of these tires should be prohibited, and that the substance of the rule proposed on November 27, 1971, should be implemented. Data which the NHTSA receives from manufacturers show an annual production of these tires in the neighborhood of 200,000 units. The NHTSA has concluded that it cannot by enforcement measures alone prevent a significant number of these tires from being sold as "reclassified tires" for use on motor vehicles.

As indicated in the preamble to the notice of November 27, the tire industry manufactures tires designed specifically for off-road applications which are not greatly more expensive than most reclassified tires. The dangers that may result from vehicles equipped with substandard tires far outweigh, in the opinion of NHTSA, the economic benefits obtainable from allowing these tires to be sold for off-road purposes.

Certain issues raised by the comments to the notice of proposed rulemaking have been determined to be of merit, and they are incorporated into this amendment. The comments pointed out that the reference to all tires of the type and size designation found in the appendix of Standard No. 109 included tires other than passenger car tires, namely, certain tires manufactured for agricultural purposes that are not required to conform to Standard No. 109. As issued, this amendment applies only to those tires of a type and size designation appearing in the appendix of Standard No. 109 that are designed for use on passenger cars.

The comments also pointed out that prohibiting the sale of these tires as of the amendment's effective date would penalize many dealers who may have large stocks of such tires on hand. It was not the NHTSA's intention to penalize dealers, who in good faith have purchased such tires for sale as "reclassified tires" under existing regulations, but rather to prevent the further reclassification of tires by manufacturers, and to require them to dispose of such tires in a way that their use as motor vehicle equipment will be impossible. This amendment, therefore, applies to tires manufactured (not sold) after its effective date and prohibits, after that date, the further reclassification of tires and their sale by manufacturers. "Reclassified tires" presently on dealer's shelves may continue to be distributed and sold in accordance with the existing provisions (S6.) of Standard No. 109 dealing with reclassified tires until supplies are exhausted.

The comments further pointed out that the language of the notice that prohibited the sale of these tires "for any purpose" would not allow them to be sold even for scrap materials. The comments indicated that advantageous uses for scrap tires are presently being developed. The NHTSA has no reason to prevent the sale of these tires if their use as motor vehicle equipment is impossible, and the amendment allows their sale as scrap materials.

In light of the above, Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," appearing at 49 CFR 571.109, is amended . . . .

Effective date: October 1, 1972. The purpose of this amendment is to prevent a practice which is in violation of existing regulations, and whose continuance poses a threat to all users of the highways. Accordingly, it is hereby found that good cause exists for an effective date less than 180 days from the day of issuance.

This notice is issued under the authority of sections 103, 112, 119, and 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1407, 1421) and the delegation of authority at 49 CFR 1.51.

Issued on August 11, 1972.

Douglas W. Toms
Administrator

37 F.R. 16604
August 17, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–23; Notice No. 2)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires", to require safety labeling information to be placed on the tire between the maximum section width and the bead, in order that this information can be retained on the casing if the tire is retreaded. A notice of proposed rulemaking regarding this subject was issued on December 21, 1971 (36 F.R. 24824).

A majority of the comments received in response to the notice agreed with the intent of the proposed amendment. However, objections were raised to the proposed requirement that the labeling information be located between the maximum section width and the bead on both sidewalls. The comments indicated that the use of whitewall designs limited the area between the section width and the bead, and that as a consequence, certain labeling information is placed between the maximum section width and the shoulder area to comply with the labeling requirements of Standard No. 109. Placing the information between maximum section width and bead on both sidewalls would evidently require the redesigning both of molds and lines of tires.

The agency has concluded after review of the information submitted to the docket that all labeling information should be located on both sidewalls of the tires as presently required by Standard No. 109. However, in response to the objections to the proposed requirements, only one sidewall is required to have the labeling information between the maximum section width and the bead. This will still allow information to be retained on casings so that retreaders need not relabel tires in meeting the requirements of Standard No. 117 (49 CFR 571.117).

In light of the above, Paragraph S4.3 of Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires", § 571.109 of Title 49, Code of Federal Regulations, is amended . . . .

Effective Date: July 1, 1973.

This notice is issued under the authority of sections 103, 112, 113, 114, 119 and 201 of the National Traffic and Motor Vehicle Safety Act, 15 USC 1392, 1401, 1402, 1403, 1407, 1421, and the delegation of authority at 49 CFR 1.51.

Issued on October 31, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 23536
November 4, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–23; Notice 3)
(Docket No. 1–8; Notice 10)

This notice amends Motor Vehicle Safety Standards Nos. 109 and 117 (49 CFR 571.109) to reduce the minimum size of permanent safety labeling to 0.078 inches. Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," was amended November 4, 1972 (37 F.R. 23536), to specify both a location on the tire sidewall for safety labeling and a labeling size of not less than 3/32 of an inch. Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires", was amended March 23, 1972 (37 F.R. 9590), to specify permanent labeling of the same minimum size.

The Michelin Tire Company has protested that the 3/32 inch minimum size is inconsistent with the existing practice of European tire manufacturers of labeling tires in letters having a size of 0.078 inches (2mm). It has pointed out that as a consequence of the amendment, European tire manufacturers will have to increase the size of all existing labeling. The NHTSA has concluded that the difference between letters 0.078 inches in size and those of 0.093 inches is not significant, and does not justify the resultant expense to manufacturers of modifying tire molds. By this notice the NHTSA therefore reduces the minimum size to 0.078 inches for labeling required by S4.3 of Standard No. 109.

Because the permanent labeling provisions of Standard No. 117 are intended to be ultimately met with new tire labeling, the size requirements for permanent labeling in that standard are also modified.

In light of the above, Motor Vehicle Safety Standard No. 109, 49 CFR 571.109, and Motor Vehicle Safety Standard No. 117, 49 CFR 571.117, are amended as follows:

Effective dates: July 1, 1973, for the amendment to S4.3 of 49 CFR 571.109; February 1, 1974, for the amendment to S6.3.2 of 49 CFR 571.117. These amendments relieve an unnecessary restriction without a significant effect on motor vehicle safety. Consequently, it is found for good cause that notice and public procedure thereon are unnecessary, and that an effective date less than 180 days from the day of issuance is in the public interest.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegations of authority at 49 CFR 1.51.)

Issued on March 8, 1973.

James E. Wilson
Acting Administrator

38 F.R. 6999
March 15, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71-10; Notice 3)

This notice amends the requirements for high speed performance and endurance applicable to passenger car tires in Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires", by adding additional criteria to the description of tire failure. A notice of proposed rulemaking on which this amendment is based was published September 20, 1972 (37 F.R. 19381). That notice proposed to modify the criteria for tire failure in both Standard No. 109 and Standard No. 117, "Retreaded Pneumatic Tires". As the tests for high speed performance and endurance have been revoked in Standard No. 117, this amendment affects only the requirements of Standard No. 109.

The proposal of September 20, 1972, was designed to expand the description of tire failure to include certain characteristics which had appeared in tires tested by NHTSA, and which were considered to be evidence of potential in-service tire failure, but which were not specifically prohibited by the existing language of the standard. These conditions included tread-groove cracking, deep sidewall separations, and damage to areas such as the tire innerliner. Standard No. 109 presently prohibits tires tested to the high speed performance and endurance tests of the standard from exhibiting "tread, ply, cord, or bead separation, chunking, or broken cords". The proposal would have prohibited, as a result of either of the two tests, the displacement of any tire component from its design position, including partial or complete separation of any component from any other component, but would not have prohibited exposure of chafer fabric and surface cracking that did not expose ply cord or belt cord. Any crack in a tread groove that exceeded three-sixteenths of an inch in length would, however, have also been prohibited. The proposal also contained an "air-loss" test, which would have required the tire to retain at least 95 percent of its initial inflation pressure when measured immediately after each performance test.

Numerous comments were received in response to the proposal. While most were in agreement with its general purpose, to provide a more inclusive definition of tire failure, almost all disagreed with the method proposed. The principal objection, raised by the Rubber Manufacturers' Association and major tire companies, was that the proposed language was too broad: that it included within the concept of tire failure many conditions that were in no way detrimental to tire performance. It was pointed out that many such conditions might exist in tires before laboratory wheel tests had been conducted and were considered by industry to be no more than inconsequential manufacturing imperfections. The comments argued that such conditions included cracking at an innerliner splice, innerliner blisters, innerliner folds, mold off-register, sidewall blisters, light tread, tearing or chipping of tread element, cord impression in the bead area, light bead, and bead cracks at the toe. The comments suggested as an alternative to the proposed language that the requirements be revised to specifically include the problem conditions that NHTSA testing had produced, and provided possible definitions to describe these conditions.

The NHTSA has determined that this suggested approach will satisfy the purpose of the proposal, and adopts it essentially as suggested by the domestic tire industry. Prohibitions against sidewall and innerliner separation, cracking, and open splices will be added to the standard. New definitions, for "innerliner" and "innerliner separation", "cracking", "open splice", and "sidewall separation" are added to the standard. These definitions are essentially as suggested by the Rubber Manufacturers' Association, with the exception of "innerliner separation". The suggested definition would have limited tire failures involving innerliner separation to those demonstrating air loss. The NHTSA has not adopted this air-loss restriction for the following reasons. First, the NHTSA is of the opinion that innerliner separation exhibited on a "hot tire", one having just completed either of the laboratory wheel tests, is evidence of potential in-service tire failure, irrespective of whether actual air loss has occurred at that point. Second, the air-loss test adopted for the standard, and discussed in greater detail below, measures only a gross, or substantial air loss occurring during the test, and not the type of lesser air-loss that might result from an innerliner separation.

The standard is presently silent with respect to the method for determining whether the prohibited tire conditions exist. Several comments proposed that the failure modes be determined "visually". One comment suggested that touch, or X-rays, be specified. As amended, the standard specifies that prohibited conditions will, consistently with the larger body of opinion, be determined visually. This method is that used by NHTSA in past testing, and it has proven satisfactory. It is specifically included in the standard for purposes of clarification, but is not intended to preclude the use of simple hand magnification.

The standard is likewise silent on the issue of a given tire's condition before the running of the two laboratory wheel tests. The position taken by NHTSA in its enforcement of this standard up to now is that the specified laboratory tests are not required to be performed in order for a tire to be considered a failure, when the tire evidences any of the prohibited conditions before it is subjected to either test. The Rubber Manufacturers' Association submission to this docket implicitly reflects this point of view. The substance of that submission was that the proposed language would have categorized as failures certain conditions which appear in untested, newly manufactured tires. The NHTSA is specifically amending Standard No. 109 in this issuance to reflect past agency interpretation and enforcement practice, by adding to the general requirements language prohibiting any tire before test from exhibiting those characteristics prohibited after either of the laboratory wheel tests.

One comment requested that a minor loss of tread resulting from the micro-siping process should not be considered a failure, despite the fact that this condition arguably comes within the prohibitory language. The position of the NHTSA is that micro-siping should be treated similarly to any other manufacturing process. Consequently, the removal of very small tread section during micro-siping, which is part of the manufacturing process, will not be considered a nonconformity. However, where the chunking of tread occurs as a result of the specified laboratory wheel tests, it will be considered a failure regardless of its amount.

One comment argued that the proposed test procedure, calling for a test rim that undergoes no permanent deformation, was not reflective of actual conditions. It argued that such a rim would have to be of massive construction, and suggested alternatively the continued use of existing test rims. The comment misunderstands the purpose of the procedure. The condition precluding any permanent deformation of the rim is intended only to ensure, together with the other language regarding air loss, that any air leaks will result necessarily from the tire, and not the test device. In other words, the provision is inserted to ensure that the tire will not be "blamed" for any air loss due to rim deformation. The condition that the rim undergo no permanent deformation is not intended to require the manufacture of a new genre of test rims; in practice, test rims currently in use do not deform significantly during the laboratory wheel test procedures, and the amended regulation will not prevent their continued use.

Many comments objected to the proposed air loss test, requiring the tire to have at least 95 percent of its original cold inflation pressure when tested immediately after both the high speed and endurance tests. The comments argued that conducting an air-pressure reading immediately after the running of the tests was potentially hazardous to persons conducting the test. In addition, certain comments argued that the 95 percent air-retention requirement was inadequate, in that the test called for the measurement to be made on a "hot" tire, and the pressure would be significantly less if the tire were first allowed to cool.

The NHTSA has retained in the amendment both an air-loss test, and the requirements that the measurement be made, as proposed, immediately after both the high speed and endurance tests are completed. The NHTSA believes that inspection of the tire to determine if any prohibited conditions exist should be made when the tire is still at the higher temperatures created during the laboratory tests. As tires do increase in temperature during actual use, the inspection of tested tires at higher temperatures provides a more realistic environment for the discovery of conditions that can result in failure. Thus, it becomes mandatory to conduct the air-loss test immediately after the tire has been subjected to the laboratory wheel tests in order that the inside of the tire can be examined for failure modes while the tire is still at higher temperatures.

The NHTSA does not consider an objection to a test requirement on the basis that it may present a hazard to testing personnel to have merit. Test laboratories are places where products are subjected to extreme, often destructive, processes under controlled conditions by trained technicians using whatever equipment and safeguards are necessary, in order to assure the safety of the public that must use those products under uncontrolled conditions without comparable training or safeguards. The NHTSA is not indifferent to the safety of test technicians. On the contrary, it urges those in charge of test laboratories to take all necessary steps to assure the safety and health of their employees. But if a particular method of running a regulatory test such as the one in question here is found hazardous to test personnel, the proper remedy is not to change the regulation, but to devise methods and equipment to perform the test process safely. The NHTSA is confident that modern technology and the testing profession are equal to the task.

The argument that the proposed test allowed a significant air loss to occur is meritorious. The NHTSA has modified the proposal by restricting the allowable air-loss to not less than the tire's inflation pressure at the beginning of the tests. Admittedly, this modification is not fully responsive to the comments, for this requirement permits as well a rather significant air loss. However, the air-loss test is designed to prevent only gross, exaggerated air-loss, and not instances of slow air leaks. Moreover, while tire inflation pressure will increase under test, it appears that the amount of increase may vary greatly from test to test. Variables such as tire expansion may also affect any increase in inflation pressure. Consequently, it is difficult to establish a value, in excess of the original pressure, that can accurately indicate a condition of air loss. The NHTSA has determined, therefore, to require only that the tire, when hot, have at least its initial cold inflation pressure. This lowers the amount of permissible air loss from that proposed, prohibits the exaggerated air loss which is NHTSA's primary concern, and still takes into account the variations in inflation pressure increase that may occur.

In light of the above, Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," appearing at 49 CFR § 571.109, is amended. . . .

Effective date: March 29, 1974.

(Sections 103, 119, 201, and 202 Public Law 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421, and 1422; delegation of authority at 49 CFR 1.51.)

Issued on September 24, 1973.

James B. Gregory
Administrator

38 F.R. 27050
September 28, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–10; Notice 5)

This notice responds to petitions for reconsideration received in response to the notice, published September 28, 1973 (38 F.R. 27050), revising the performance requirements of Motor Vehicle Safety Standard No. 109 (49 CFR 571.109). That notice modified the criteria for tire failure when tires are subjected to the high speed performance and endurance tests of the standard.

Timely petitions for reconsideration were received from five parties: The Firestone Tire and Rubber Company, Rubber Manufacturers' Association, Uniroyal Tire Company, B. F. Goodrich Tire Company, and the General Tire and Rubber Company. The petitions requested the agency to reconsider the definition of "innerliner separation" and the requirement that the tire be removed from the test wheel for inspection immediately after the prescribed tests are completed.

The petitions have argued that the definition of "innerliner separation" (a "parting of the innerliner from the carcass") is inconsistent with the definition of "carcass" ("the tire structure, except tread and sidewall rubber"), for the former unlike the latter creates the inference that the innerliner is not part of the carcass. One petitioner (B. F. Goodrich) argued that innerliner should not be considered part of the carcass and would redefine carcass to so specify. The NHTSA agrees with the comments which argue that the definition of "innerliner separation" should reflect that the innerliner is part of the carcass. That definition is accordingly modified as recommended by the petitions to mean a separation of the innerliner from the cord material of the carcass. The NHTSA believes no ascertainable benefit would be achieved by further distinctions within the definition of "carcass." The requirement prohibiting the separation of the innerliner from the carcass cord material is the same whether or not the definition of "carcass" is further refined.

The petitions also state that innerliner is frequently composed of more than one layer of material. The definition of innerliner is revised to take this into account. However a separation of one innerliner layer from another does not constitute "innerliner separation" under the standard. That term means only a separation of the innerliner from the carcass cord material. The requirements specify that "visual evidence" of enumerated conditions will constitute a failure to the standard. The NHTSA believes the visual test, which has been consistently used in the past, to be satisfactory. However, in the case of innerliner separation, the visual evidence may not reflect an actual separation of the cord material from the innerliner. In such cases the standard is not intended to preclude a more detailed examination of the condition, including a cutting of the tire. This procedure has been afforded to manufacturers in past NHTSA enforcement efforts, and is considered consistent with the revised requirements.

The petitions also requested modification of the requirement that each tested tire be removed from the test wheel for inspection immediately after its testing is completed. The petitions argue that rapid deflation of a hot tire can cause innerliner separation. While several petitions recommended that the tire be allowed to cool to ambient temperature, Uniroyal has indicated that a one-hour period had been found sufficient to eliminate the chance that artificially caused separations will occur. The NHTSA agrees with the comment from Uniroyal that a one-hour period is adequate for the tire to cool and has amended the standard accordingly.

The Rubber Manufacturers' Association has argued that minor nicks and tears in the tread which would not grow in size during service might be improperly considered "chunking" under the standard. RMA alludes to the discussion of the micro-siping process in the preamble to the notice of September 28, 1974, claiming it recognizes that small pieces of the tread can be broken away which do not affect performance. The standard is clear that chunking in a new tire before testing will be considered a failure. A minor tear in the tread does not appear to involve a removal of rubber from the tire, and is not within the definition of chunking. Whether a "nick" in the tread represents chunking would necessarily be based on its size. As in micro-siping, minor tread loss resulting from the manufacturing process that is evident before test does not constitute a failure. Any loss resulting from the laboratory wheel test is a failure.

In light of the above, Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," appearing at 49 CFR 571.109, is amended. . . .

Effective date: March 29, 1974. This amendment modifies slightly amendments whose effective date was originally established as the above date on September 28, 1973. As these amendments relieve restrictions, provide clarification, and impose no additional burden on any person, good cause is found for an effective date less than 30 days from publication.

(Secs. 103, 110, 201, and 202, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421, and 1422; delegation of authority at 49 CFR 1.51.)

Issued on March 25, 1974.

James B. Gregory
Administrator

39 F.R. 11423
March 28, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 74–29; Notice 1)

This notice republishes and corrects the text of Federal Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109a), excluding Table I of the Appendix.

The corrections eliminate both typographical errors which occurred in the codification of the standard (in the *Code of Federal Regulations*) and material now extraneous as a result of amendments to the standard and the adoption of the Tire Identification and Recordkeeping Regulations, 49 CFR Part 574. The corrections are as follows:

(1) Figure 1 is deleted, and Figures 2 and 3 are redesignated Figures 1 and 2 respectively.

(2) Paragraph S5.2.1.3 and S5.2.2.1 are modified to reflect the changes in the designations of Figures 2 and 3.

(3) Paragraph S6 is corrected to reflect the amendment of August 17, 1972 (37 F.R. 16604), by deleting paragraph S6.1 and the paragraphs following.

The notice also redesignates the standard as § 571.109. The previous designation, § 571.109a, resulted from an amendment (38 F.R. 27050, September 28, 1973) with a future effective date (March 29, 1974) outstanding at the time the most recent version of the Code was published. The passing of that effective date eliminates the need for Section 571.109a.

In light of the above, § 571.109a (excluding Table I of the Appendix) of Title 49, Code of Federal Regulations, is redesignated § 571.109 and corrected and republished . . . .

(Secs. 103, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421, 1422; delegations of authority at 49 CFR 1.51.)

Issued on August 7, 1974.

James B. Gregory
Administrator

39 F.R. 31322
August 28, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 74-3; Notice 2)

This notice amends Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) to specify the use of test wheels having up to 6 test positions in NHTSA compliance testing. A notice of proposed rulemaking regarding this subject was published January 10, 1974 (39 F.R. 1516).

Standard No. 109 has not previously specified the number of test positions which may be present on any given test wheel. Agency testing has been conducted on test wheels having up to six positions, which appears to be the maximum capacity of these wheels. The NHTSA is of the opinion that this testing is fully consistent with the standard's test procedure, but in order to avoid legal disputes has decided to clarify the standard by specifically incorporating into it NHTSA's present compliance testing practice.

The one comment which was received regarding the proposal did not object to the amendment's substance, but requested that temperatures be carefully monitored in NHTSA testing. The test temperature is specified in the standard and applies to each test regardless of the number of positions on a given test wheel. The NHTSA will continue to carefully monitor its tire testing program to ensure the accuracy of the results obtained.

In light of the above, 49 CFR § 571.109 (Motor Vehicle Safety Standard No. 109) is amended by the addition of a new paragraph (f) in S4.2.1 . . . .

Effective date: October 7, 1974. This amendment is clarifying in nature, reflecting present practice, and poses no additional burden on any person. Consequently, good cause is found for an effective date less than 180 days from publication.

(Secs. 103, 108, 119, 201 and 202, Pub. L. 89-563; 80 Stat. 718; 15 U.S.C. 1392, 1397, 1407, 1421, 1422; delegations of authority at 49 CFR 1.51.)

Issued on August 30, 1974.

James B. Gregory
Administrator

39 F.R. 32321
September 6, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 74–25; Notice 2)

This notice amends the definition of "test rim" in 49 CFR 571.109 (Motor Vehicle Safety Standard No. 109) and modifies related provisions of that section and section 571.110 (Motor Vehicle Safety Standard No. 110). A conforming amendment is made to similar provisions in section 571.119 (Motor Vehicle Safety Standard No. 119). The notice of proposed rulemaking on which this amendment is based was published on July 10, 1974 (39 F.R. 25329).

The definition of "test rim" has previous to this amendment referenced the 1967 and earlier editions of publications of various foreign and domestic tire and rim associations as the source for determining rim specifications and appropriate tire/rim matching information for testing tires to the requirements of Motor Vehicle Safety Standard No. 109, and for equipping passenger cars pursuant to Motor Vehicle Safety Standard No. 110. The Rubber Manufacturers' Association petitioned that this reference be changed because the publications have become outdated in terms of the rim information they provide. This amendment, which adopts the proposed rule of July 10, 1974, in essentially the form proposed, deletes the references to the 1967 and earlier publications and substitutes for them the publications of the various associations current at the time of tire manufacture.

Under the amendment, a "test rim" will be any rim listed for use with a tire size designation in any of the current publications of the various foreign and domestic tire and rim associations. The listing will apply to all tires that fit the description (by tire size designation, use category, etc.) unless the publication itself or a separately published manufacturer's document states otherwise. A manufacturer wishing to except any tire manufactured by him from any listing would be expected to request the association to publish the exception in its publication. If it does not, the manufacturer must himself publish the exception in his own listing, which he must distribute to his dealers, this agency, and to any member of the public on request. The language of the proposal is clarified, and a conforming amendment made to Standard No. 119 to show that an exception must be published in each association publication listing the tire and rim combination. The amendment further specifies that a "listing" of a rim must contain dimensional specifications, including diagrams, for the rim. This is necessary to provide for uniformity of rim dimensions and reflects the present practice of association publications of publishing such dimensional specifications. However, dimensional specifications or a diagram of a rim need not be included in manufacturers' separate listings if the specifications and diagram for the rim appear in each association publication where it is listed.

By referencing the current publications, the amendment ends the need for Appendix "A" of Standard No. 110, which lists tire/rim combinations approved for use subsequent to the 1967 and earlier associations publications. The associations and various manufacturers should ascertain that all tire/rim combinations presently listed in that Appendix are incorporated into at least one of their respective publications before the effective date of this amendment. Moreover, the addition of new tire/rim combinations subsequent to the effective date becomes the sole responsibility of the industry. Appendix "A" of Standard No. 109, listing tire size designations, is not affected by this amendment.

An effect of the amended definition of test rim is to clarify this agency's position that each tire must be able to pass each performance requirement (except that for physical dimensions) of Standard No. 109 with any rim with which it is listed, regardless of rim width, unless that tire is specifically excepted from each listing where it appears. The requirements for physical dimensions must be met only on a test rim of the width specified for the tire size designation in Standard No. 109. A tire failing the requirements on any test rim would be considered as having failed the requirements on all test rims. This continues existing NHTSA enforcement policy.

One of the two comments received regarding the proposal objected to this aspect of the amendment, arguing that some manufacturers have traditionally certified conformity on the basis of test results using only the test rims of the specified test rim width and that no safety problems had been encountered. The NHTSA believes, however, that the interest of safety demands that manufacturers ensure that tires certified as conforming to Standard No. 109 will conform to the standard's requirements on any rim which the manufacturer lists for use with the tire and with which the tire may consequently be used in service. This position has been reflected in the guidelines for the additions of new tire/rim combinations to the Appendix of Standard No. 110, which have required that the manufacturer demonstrate conformity to Standard No. 109 on each newly requested rim. If a manufacturer doubts the ability of his tires to conform to the standard on certain recommended rims, he has the option of excepting his tires from being used with those rims. No other objections to the proposed rule were received.

In light of the above, amendments are made to 49 CFR §§ 571.109, 571.110, and 571.119 . . . .

Effective date: August 5, 1975 for Standard No. 109 and 110; March 1, 1975, for Standard No. 119. The amendment to Standard No. 119 is of a clarifying nature, and should be made effective with the existing effective date of that standard. The amendment does not require substantial leadtime for conformity, and it is found for good cause shown that an effective date less than 180 days from publication is in the public interest.

(Secs. 103, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. §§ 1392, 1407, 1421, 1422; delegation of authority at 49 CFR 1.51.)

Issued on January 31, 1975.

James B. Gregory
Administrator

40 F.R. 5529
February 6, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 74–25; Notice 4)

This amendment of safety Standard No. 109, *New Pneumatic Tires*, permits the manufacture of both a new series of tires having load ratings and inflation pressures expressed in metric units and a newly designed tire having a maximum inflation pressure of 60 psi. The change for metric-unit tires accommodates a world-wide standardization process, and the change for 60-psi tires accommodates tires designed as substitutes for conventional spare tires, in order to reduce the overall weight of, and increase storage space in, passenger cars.

Effective date: March 7, 1977.

For further information contact:

Arturo Casanova
Office of Crash Avoidance
Motor Vehicle Programs
National Highway Traffic
Safety Administration
Washington, D.C. 20590
(202–426–1715)

On September 30, 1976, the NHTSA published a proposed rule (41 FR 43192) to amend the requirements of Standard No. 109 (49 CFR 571.109) as indicated in the summary statement. All comments received supported the amendments, except that Dunlop Corporation suggested that adoption of metric-series tires be delayed while other approaches to the world-wide standardization of tire sizes and nomenclature are studied. Because the agency's ability to further modify the standard in response to future standardization efforts is not hindered by final action on metric-series tires, the proposed changes are adopted, for the reasons set forth below.

TIRE PERFORMANCE REQUIREMENTS

Goodyear Tire and Rubber Company and the Rubber Manufacturers Association (RMA) petitioned for the adoption of new requirements and test specifications necessary to permit the production of a metric-series family of tires that differ in specification and construction from existing tire types. The metric-series tires have load ratings expressed in kilograms (in place of pounds) and inflation pressures expressed in kilopascals (kPa) (in place of pounds per square inch (psi)).

Firestone Tire and Rubber Company petitioned for the adoption of new requirements and test specifications necessary to permit the production of a "temporary use" spare tire that differs substantially in specification and construction from conventional tires. This tire type has a higher inflation pressure (60 psi), different dimensions, and a shorter treadwear life than conventional tires. In some cases its diameter may differ from that of the conventional tires it is designed to replace.

The NHTSA concluded that the new tire types should be accommodated by appropriate revisions of the requirements and test specifications, as long as they can meet the same safety performance levels of the standard as conventional tires do. Data supplied by Firestone indicate that no significant degradation of vehicle handling occurs when the 60-psi tire is used on a vehicle in conjunction with three conventional tires, despite the substantial differences in its construction and other characteristics.

Endurance and high-speed performance. The standard sets forth endurance and high-speed performance requirements that are conducted by pressing the tire against a test wheel at various levels of force. The appropriate force levels are taken from tables of information contained in the standard that list each passenger car tire size presently produced for use in the United States.

In anticipation of deletion of these tire tables, the agency proposed that the appropriate force levels for the new tire types be stated as percentages of the maximum load rating of the tire, corresponding to the values set out in the standard's existing tables, but without the need to add additional tables to the standard.

Vehicle manufacturers, the RMA, and Goodyear requested that, in the case of metric-series tires, the new force levels be adopted using tire tables instead of the percentage method. Detailed review of the proposal demonstrates that use of a flat percentage would have an unintended result. Specifically, the tire selection standard for passenger cars (Standard No. 110, *Tire Selection and Rims* (49 CFR 571.110)) requires that the normal load-carrying ability assigned to a tire be no more than that used for the test loading in the Standard No. 109 high-speed performance test. Thus, the practical result of replacing specifically assigned test loads in Standard No. 109 with percentages would be an unintentional reduction of the tire's assignable load-carrying capabilities in some cases. Goodyear and the RMA provided tire tables for the metric-series tires that specify values that are approximately the same as the percentage values proposed.

Having reviewed these comments and the tables provided by the tire industry, the NHTSA finds that test values derived from the tables are, for safety purposes, virtually the same as the percentage values proposed and therefore fall within the ambit of the proposal. Accordingly, the agency has decided to incorporate additional tables in the standard as the basis for amendments of the high speed and endurance requirements for metric-series tires. Percentage values are required for the 60-psi tires because their tire tables do not list the appropriate values.

The general issue of deletion of tire tables from Standard No. 109 will be addressed comprehensively in future rulemaking.

With regard to the new tire tables, Goodyear and the RMA noted that additional metric-series tire sizes have been developed since the submission of their petitions. Firestone noted that additional 60-psi type tires have also been added to those proposed. These commenters asked that the additional tire listings be added to the standard. Although not proposed, the agency believes that the new listings can be added to the standard in the same manner that routine tire table changes are regularly made by the agency in accordance with published procedures (33 FR 14964, October 5, 1968) (39 FR 28980, August 31, 1974). These guidelines specify procedures by which routine additions are made without notice, unless any objection is subsequently received.

Testing of a conventional tire on a test wheel is conducted at the "design" load level (with overloading in the case of endurance testing up to the maximum load rating of the tire) and corresponding inflation pressure. Because the 60-psi tire does not have a "design" load level but only a single load level at its maximum inflation pressure of 60 psi, the agency used this single load level as if it constituted the design load level. The RMA demonstrated that the single load level of these tires is more accurately characterized as its maximum load level, and that a lower load level would constitute the tire's design load. Because the 60-psi tire is intended only for occasional use as a spare tire, it is not assigned the lower "design" load ratings that are provided in the case of conventional tires to improve vehicle ride.

The NHTSA accepts this view of the 60-psi tire's design load rating and makes appropriate adjustments in the tables that appear in S5.4.2.3 and S5.5.1. In the case of inflation pressures, 52- and 58-pound values are utilized in Table III, consistent with comparable values for conventional tires.

Strength requirements. The agency proposed breaking energy requirements for the new tire types that are comparable to those for existing tires. The only comment on these proposed amendments were RMA suggestions for modification of terminology and the statement of breaking energy values in Table III. The test values are made final as proposed.

The RMA believed that reference to tires with a certain "designated" section width would be clarified by reference to "specified" section width instead. The agency disagrees, and notes that the word "designated" conveys the intended meaning that section width characteristics are controlled by the manufacturer and not "specified" by this or any other Federal regulation.

In its comments on this and other aspects of the proposal, the RMA suggested that the listing of English-system equivalents following metric-system values (and vice versa) would improve the clarity and informational value of Standard No. 109. General Motors Corporation (GM) also encouraged the listing of measurement equivalents in safety standards.

The agency believes it made clear in its proposal the reason why the publication of equivalent values in a motor vehicle safety standard is totally inappropriate. Motor vehicle safety standards are not informational or advisory documents but rather are minimum standards which must be complied with on pain of civil penalty. For this reason they must be stated objectively, without confusion. Because the equivalence of the metric and English systems is not exact, using significant figures, the listing of approximate English-system equivalents in the standard would produce some confusion concerning what are the real test conditions or performance levels required. For example, several NHTSA requirements specify a 30-mph barrier crash as a procedure underlying certain minimum crashworthiness capabilities. If the metric equivalent (49 km/h) were listed next to this 30-mph value, it would convey the impression that the manufacturer (and the agency) has the choice whether to test at 30 mph or at 30.4 mph. Thus, the statement of an "equivalent value" that is not in fact equivalent only confuses in a regulatory environment where objectivity is important and is required by statute (15 U.S.C. § 1392(a)). For this reason, the RMA suggestion to add English-system and metric equivalents to Table II and the GM suggestion to add "dual dimensioning" throughout the standard are not adopted.

Physical dimensions. The NHTSA proposed a "growth allowance" for the new tire types that is comparable to the requirement for existing tires, with the addition of a 0.4-inch minimum for technical reasons in the case of both the metric-series tires and the 60-psi tire. Goodyear and the RMA requested that the 0.4-inch allowance be restated as a 10-millimeter allowance, in view of its association with metric series tires. These requests are denied, because the 0.4-inch allowance is also associated with the 60-psi tire which does not have metric values. As a general matter, the agency intends to make a systematic change to metric measurements in its standards, rather than making isolated and arbitrary changes which consist of simple substitutions of near equivalents without regard to the basic units of the metric system.

Tubeless tire resistance to bead unseating. The NHTSA proposed that the force levels which must be sustained by conventional tubeless tires without bead unseating should be modified appropriately for the 60-psi tire because of its uncharacteristic section width. No objection was made to the proposed performance values and they are made final without change. The RMA noted that its earlier recommendations for test fixture modification should be implemented in two minor respects based on further testing of the new tire type. One dimension of the text fixture should have been three-tenths-of-an-inch longer than proposed, and the cross section of the bead unseating block should have been narrower to avoid contact with the rim on which the tested tire is mounted. The agency considers these minor modifications from the proposed values to fall within the scope of the proposal and adopts the changes in the final rule.

TIRE LABELING

The NHTSA proposed that the metric-unit inflation pressure and load rating on metric-series tires be supplemented by English-system equivalents on the tire sidewall. Unlike the confusing listing of near-equivalent values in a performance standard, the use of equivalent markings on the tire sidewall can be of substantial benefit to the user without introducing confusion. No commenter objected to the proposed supplementary markings, and they are made final as proposed. General Motors suggested that "rounding" conventions be established to further assist the consumer. The agency does not wish to restrict the tire manufacturer's latitude in this area, and declines to adopt this suggestion in the absence of a demonstrable safety problem.

The agency proposed that the legend "Inflate to 60 psi" appear on the sidewall of the new 60-psi tire to make clear its distinctive inflation requirement. The RMA suggested that the proposed limits on location of the legend should be somewhat relaxed in view of the comparatively small size of the 60-psi sidewall. The agency agrees that some relaxation of the requirement is justified. As made final, location of the legend is limited to the area between the tire shoulder and the bead of the tire.

OTHER CONSIDERATIONS

The agency specifically addressed the possibility that consumers would have difficulty with the unconventional characteristics of the 60-psi tire, and that some safety problems could result from the confusion. The only problem raised by the agency that was responded to by commenters was the issue of storage of a large conventional tire after replacement by the smaller 60-psi tire, assuming that the car's trunk were full. Commenters minimized the extent of the problem, and Firestone noted that a majority of tires fail when the vehicle has been parked for a significant period of time, not on the highway.

In consideration of the foregoing, Standard No. 109 (49 CFR 571.109) is amended. . . .

Effective date finding: Because the amendments relieve a restriction and do not create additional requirements for any person, and because of vehicle manufacturers' need to settle on allowable tire designs as soon as possible, an immediate effective date is found to be in the public interest.

(Sec. 103, 112, 114, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on March 1, 1977.

John W. Snow
Administrator

42 F.R. 12869
March 7, 1977

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 74–25; Notice 6)

This amendment clarifies the applicability of the Figure 2A bead unseating block and corrects typographical errors in Figure 2A. This amendment is made pursuant to a request from the Rubber Manfacturers Association (RMA).

Effective Date: March 23, 1978.

For Further Information Contact:

John A. Diehl, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1715).

Supplementary Information: The Rubber Manufacturers Association (RMA) has petitioned the National Highway Traffic Safety Administration (NHTSA) to amend the language of S5.2.1.3 of Federal Motor Vehicle Safety Standard (FMVSS) 109 to clarify that only a Figure 2A bead unseating block is to be used in testing tires having an inflation pressure of 60 psi. The current language has created uncertainty as to whether only the Figure 2A block must be used, or whether both the Figure 2 and Figure 2A blocks must be used, depending on the type of tire being tested. In addition, the RMA requested the correction of several typographical errors in Figure 2A.

The NHTSA agrees that the current language is ambiguous and that Figure 2A contains inaccuracies. The NHTSA therefore finds both RMA requests to be reasonable, and they are granted.

As this amendment is interpretative in nature and reflects current understanding and practice, it is found for good cause that notice and public procedure thereon are unnecessary, and that an immediate effective date is in the public interest.

The principal authors of this document are John A. Diehl, Crash Avoidance Division, and Robert M. Churella, Office of Chief Counsel.

Accordingly, paragraph S5.2.1.3 of 49 CFR § 571.109 is amended. . . .

(Secs. 103, 119, 201, and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegation of authority at 49 CFR 1.50.

Issued on March 17, 1978.

Joan Claybrook
Administrator

43 F.R. 12015
March 23, 1978

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires for Passenger Cars

(Docket No. 80-01; Notice 1)

ACTION: Final rule.

SUMMARY: Pursuant to petitions by the Rubber Manufacturers Association (RMA) and the Michelin Tire Corporation (Michelin), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars,* by adding certain tire size designations to Appendix A of that standard. This amendment permits the introduction into interstate commerce of the new tire sizes.

EFFECTIVE DATE: 30 days from the date of publication in the Federal Register, if objections are not received before that date. March 20, 1980.

ADDRESSES: Comments should refer to Docket No. 80-01 and be submitted to Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours 8 a.m. to 4 p.m.)

FOR FURTHER INFORMATION CONTACT:

John Diehl, Office of Automotive Ratings,
National Highway Traffic Safety Administration,
400 Seventh Street, S.W., Washington, D.C.
20950 (202-426-1714).

SUPPLEMENTARY INFORMATION:

According to agency practice, the National Highway Traffic Safety Administration (NHTSA) responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 FR 14964; October 5, 1968, and amended at 36 FR 8298; May 4, 1971; 36 FR 13601; July 22, 1971; and 39 FR 28980; August 13, 1974. These guidelines provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by NHTSA during this 30 day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

On November 27, 1979, RMA petitioned for the addition of a new tire size to an existing table within Table I of Appendix A of Standard No. 109. RMA also petitioned on December 4, for the addition of three other tire sizes to existing tables in Table I. Further, RMA petitioned on December 4, for the addition of a new table to Table I, and requested that this new table list two tire sizes. Michelin petitioned for the addition of two new tires sizes to an existing table on November 7, 1979. On November 26, Michelin petitioned for the establishment of a new table to Table I, and that this table include a new tire size. The bases for accepting or denying requests to add new tire size designations are set forth in the introductory guidelines to Appendix A. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables, and the appropriateness of the requested location within the tables of the requested tire sizes. The eight new tire size designations requested to be added to Standard No. 109 appear to meet these criteria. Accordingly, the RMA and Michelin petitions are granted, and eight new tire sizes are added to Table I of Appendix A of the Standard pursuant to the abbreviated rulemaking procedure.

In consideration of the foregoing, 49 CFR § 571.109 is amended as specified below, subject to the 30 day comment period outlined above:

§ 571.109 *New Pneumatic Tires—Passenger Cars* (Appendix amended)

1. Tables I-KK, I-RR, and I-WW are amended by adding the following new tire size designations and corresponding values:

Table I-KK

TIRE LOAD RATING, TEST RIMS, MINIMUM SIZE FACTORS AND SECTION WIDTHS FOR "P/60" SERIES ISO TYPE TIRES

Tire size designation [1]	Maximum tire loads (kilograms) at various cold inflation pressures (kPa)									Test rim width (inches)	Minimum size factor (mm)	Section [2] width (mm)
	120	140	160	180	200	220	240	260	280			
P265/60 R 15 __________	645	695	745	790	835	875	915	950	985	7	943	262

[1] The letter "H", "S", or "V" may be included in any specified tire size designation adjacent to the "R".

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

Table I-RR

TIRE LOAD RATING, TEST RIMS, MINIMUM SIZE FACTORS AND SECTION WIDTHS FOR "P/65" SERIES ISO TYPE TIRES ALL MILLIMETRIC FOR TR OR JM RIMS

Tire size designation [2]	Maximum tire loads (kilograms) at various cold inflation pressures (kPa) [1]									Test rim width (mm)	Minimum size factor (mm)	Section [3] width (mm)
	120	140	160	180	200	220	240	260	280			
P195/65 R 365 __________	400	430	460	490	515	540	565			135	800	194
P225/65 R 39 ___________	535	575	615	655	690	720	755			165	894	228

[1] The letter "H", "S", or "V" may be included in any specified tire size designation adjacent to the "R".

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

[3] The letter "D" for diagonal and "B" for bias-belted may be used in place of the "R"

Table I-WW

TIRE LOAD RATING, TEST RIMS, MINIMUM SIZE FACTORS AND SECTION WIDTHS FOR "P/65" SERIES ISO TYPE TIRES

Tire size designation [1]	Maximum tire loads (kilograms) at various cold inflation pressures (kPa)									Test rim width (inches)	Minimum size factor (mm)	Section [2] width (mm)
	120	140	160	180	200	220	240	260	280			
P195/65 R 13 ___________	375	400	430	455	480	505	525	550	570	5½	767	196
P205/65 R 14 ___________	425	460	495	525	550	580	605	630	655	5½	811	203
P255/65 R 15 ___________	650	705	750	795	840	880	920	960	995	7	950	255

[1] The letter "H", "S", or "V" may be included in any specified tire size designation adjacent to the "R".

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

2. Two new tables, Table I-XX and I-YY, are added to Table I of Appendix A to read as set forth below:

Table I-XX

TIRE LOAD RATING, TEST RIMS, MINIMUM SIZE FACTORS AND SECTION WIDTHS FOR "P/70" SERIES ISO TYPE TIRES ALL MILLIMETRIC FOR TR OR JM RIMS

Tire size designation [2]	Maximum tire loads (kilograms) at various cold inflation pressures (kPa) [1]									Test rim width (mm)	Minimum size factor (mm)	Section [3] width (mm)
	120	140	160	180	200	220	240	260	280			
P165/70 R 365 __________	325	350	375	395	420	440	460			120	752	167

[1] The letter "H", "S", or "V" may be included in any specified tire size designation adjacent to the "R".

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

[3] The letter "D" for diagonal and "B" for bias-belted may be used in place of the "R".

Table I-YY

TIRE LOAD RATING, TEST RIMS, MINIMUM SIZE FACTORS AND SECTION WIDTHS FOR "P/55" SERIES ISO TYPE TIRES

Tire size designation [1]	Maximum tire loads (kilograms) at various cold inflation pressures (kPa)									Test rim width (inches)	Minimum size factor (mm)	Section [2] width (mm)
	120	140	160	180	200	220	240	260	280			
P255/55 R 14 ___________	535	575	615	655	690	725	755	785	815	7	875	255
P255/55 R 15 ___________	560	605	645	685	720	755	790	825	855	7	900	255

[1] The letter "H", "S", or "V" may be included in any specified tire size designation adjacent to the "R".

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended without regard to the 15 page limit. This limitation is intended to encourage commenters to detail their primary comments in a concise fashion. Those persons desiring to be notified upon receipt of their comments in the rules docket should enclose a self-addressed, stamped postcard in the envelope with their comments. Upon receiving the comments, the docket supervisor will return the postcard by mail.

The agency has reviewed the impacts of this rule, and determined that permitting the introduction of these tire sizes will benefit those manufacturers desiring to produce the sizes and will have no effect on those manufacturers who do not. The public will be minimally affected by this rule. Accordingly, NHTSA has determined that this is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this rule are John Diehl and Stephen Kratzke, respectively.

Issued on February 11, 1980.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

45 F.R. 10798
February 19, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 80-01; Notice 3)

ACTION: Final rule.

SUMMARY: Pursuant to petitions by the Japan Automobile Tire Manufacturers Association (JATMA), Michelin Tire Corporation (Michelin), and the Rubber Manufacturers Association (RMA), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars,* by adding certain tire size designations to Appendix A of that standard. This notice also corrects some dimensions for a tire size in which RMA calculated those dimensions using the wrong test rim width. This amendment permits the introduction into interstate commerce of the new tire sizes.

EFFECTIVE DATE: 30 days from the date of publication in the *Federal Register,* if objections are not received before that date.

ADDRESS: Comments should refer to Docket No. 80-01 and be submitted to Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours are 8 a.m. to 4 p.m. Monday through Friday.)

FOR FURTHER INFORMATION CONTACT:

Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-0852).

SUPPLEMENTARY INFORMATION: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 FR 14964; October 5, 1968, and amended at 36 FR 8298; May 4, 1971; 36 FR 13601; July 22, 1971; and 39 FR 28990; August 13, 1974. Those guidelines provide that these final rules become effective 30 days after their date of publication in the *Federal Register* if no comments objecting to them are received by NHTSA during this 30-day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

On May 19, 1980, JATMA petitioned for the addition of a tire size to an existing table within Table I of Appendix A of Standard No. 109. On June 25, 1980, Michelin petitioned for the addition of two new tire sizes to an existing table. RMA petitioned for the addition of four new tire sizes to existing tables on May 27, June 6, July 10, and July 14. Additionally, RMA filed a petition requesting changes to the physical dimensions published for a tire size, because RMA had erroneously calculated those dimensions using the wrong test rim width.

The bases for accepting or denying requests to add new tire size designations to the tire tables are set forth in the introductory guidelines to Appendix A. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables and the appropriateness of the location within the tables of the requested tire size. The seven new tire size designations requested to be added to Standard No. 109 appear to meet these criteria. Accordingly, the JATMA, Michelin, and RMA petitions are granted, and seven new tire sizes are added to Table I of Appendix A of the Standard pursuant to the abbreviated rulemaking procedures. Additionally, the RMA request to correct the physical dimensions for a previously published tire size is granted, and the correction is made.

In consideration of the foregoing, 49 CFR § 571.109 is amended as specified below, subject to the 30-day comment period outlined above.

§ 571.109 New Pneumatic Tires—Passenger Cars (Appendix amended)

1. Tables I-K, I-T, I-KK, I-QQ, and I-WW are amended by adding the following new tire size designations and corresponding values:

2. Table I-LL is amended, with the following values substituted for the T155/D9016 tire size:

TABLE I–LL

TIRE LOAD RATINGS, TEST RIMS, MINIMUM SIZE FACTORS, AND SECTION WIDTHS FOR "T SERIES" 60 LB/IN ² TIRES

Tire size designation [1]	Maximum tire loads (pounds at 60 p.s.i. cold inflation pressure)	Test rim width (inches)	Minimum size factor (inches)	Section width [2] (inches)
	60 p.s.i.			
T155/D 9016 ______________	2,335 lbs.	4	32.48	5.98

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended without regard to the 15 page limit. This limitation is intended to encourage commenters to detail their primary arguments in a concise fashion. Those persons desiring to be notified upon receipt of their comments in the rules docket should enclose a self-addressed, stamped postcard in the envelope with their comments. When the comments are received, the docket supervisor will return the post card by mail.

The agency has reviewed the impacts of this rule and determined that permitting the introduction of these tire sizes will benefit those manufacturers desiring to produce these sizes, and will have no effect on those manufacturers who do not. The public will be minimally affected by this rule. Accordingly, NHTSA has determined that this is not a significant regulation within the meaning of Executive Order 12044.

Issued on September 8, 1980.

Michael M. Finkelstein
Associate Administrator

45 F.R. 62083
September 18, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

Safety Standards for New Pneumatic Tires

[Docket No. 80-14; Notice 7]
[Docket No. 71-18; Notice 12]

ACTION: Technical amendment.

SUMMARY: In this agency's safety standards applicable to new pneumatic tires for use on motor vehicles, there are listings of standardization organizations whose publications of specifications are accepted under the standards as means for determining appropriate rim sizes on which to mount the tires during testing, and for providing other technical data. This agency has received two petitions requesting changes to these listings. The Society of Motor Manufacturers & Traders Ltd. (SMMT) stated that they no longer set or maintain standards for new tires, and that those functions are now handled for the group by the British Standards Institution, a group already listed in both new tire standards. SMMT requested that their name be deleted from the list of standardization organizations in the new tire standards. Japan Automobile Tire Manufacturers' Association, Inc. (JATMA) asked that the name of the Japanese group currently listed in the standard for new tires for use on motor vehicles other than passenger cars be deleted, because that group does not issue specific tire standards. JATMA, which does issue such standards, asked that its name be added to the list of standardization organizations. This notice makes the changes requested by these petitions. Additionally, this notice corrects an error in the name of the German standardization organization in the passenger car tire standard.

DATE: This amendment is effective June 6, 1983.

SUPPLEMENTARY INFORMATION: Section S4.4.1(b) of Standard No. 109, *New Pneumatic Tires—Passenger Cars* (49 CFR § 571.109), and section S5.1(b) of Standard No. 119, *New Pneumatic Tires for Motor Vehicles Other Than Passenger Cars* (49 CFR § 571.119), both contain listings of the various standardization organizations. A standardization organization is a voluntary association composed of representatives of each of the member tire companies. The purpose of a standardization organization is to establish and promulgate engineering standards for tires, rims, and their allied parts. NHTSA relies on the standardization organizations to list the acceptable rim sizes for each tire size and for certain technical information regarding the tire sizes.

Two petitions recently submitted to the agency indicate that these listings of standardization organizations need to be updated in order to reflect the current status of standardization activities. In the first petition, SMMT stated that it no longer performs any of the tasks associated with standardization organizations, and that those activities are now performed for SMMT by the British Standards Institution, a group already listed in both standards. Accordingly, SMMT requested that its name be deleted from the list of standardization organizations.

In the second petition, JATMA noted that the group currently listed in Standard No. 119 as the Japanese standardization organization is Japanese Industrial Standards. JATMA noted that that organization is an organization for all Japanese industries, not just the Japanese tire industry, and does not currently perform the functions associated with a standardization organization. JATMA does perform those functions, and is so recognized in Standard No. 109, which no longer lists Japanese

Industrial Standards. JATMA requested that Standard No. 119's list of standardization organizations be amended to correspond to the listing in Standard No. 109 with regard to the Japanese standardization organization.

Both of these petitions are granted. Additionally, the agency erroneously listed the German standardization organization as the Deutsches Institut fur Norming in its response to the petitions for reconsideration of the final rule deleting the tire tables from Standard No. 109 (47 FR 36180; August 19, 1982). The correct name for that organization, and the name which has been used in all previous agency rulemaking notices referring to that standardization organization, is Deutsche Industrie Norm. The correct name is substituted in Standard No. 109 by this amendment.

These changes represent only technical corrections to the agency's listing of recognized standardization organizations. They impose no obligations on any party, but only accommodate the wishes of the listed organizations or correct an error by this agency. Accordingly, the agency finds for good cause that notice and opportunity for comment are unnecessary, and these changes are effective as soon as this notice is published.

In consideration of the foregoing, section S4.4.1(b) of 49 CFR § 571.109 and section S5.1(b) of 49 CFR § 571.119 are revised to read as follows:

* * * * *

(b) Contained in publications, current at the date of manufacture of the tire or any later date, of at least one of the following organizations:

The Tire and Rim Association
The European Tyre and Rim Technical Organisation
Japan Automobile Tire Manufacturers' Association, Inc.
Deutche Industrie Norm
British Standards Institution
Scandanavian Tire and Rim Organization

* * * * *

Issued on May 27, 1983

Diane K. Steed,
Acting Administrator.

48 F.R. 25209
June 6, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

[Docket No. 85-03; Notice 1]

ACTION: Technical amendment. Correction of Error in Code of Federal Regulations.

SUMMARY: This agency has discovered an error in Title 49 of the Code of Federal Regulations relating to two of the tables following Standard No. 109, *New Pneumatic Tires—Passenger Cars.* This notice corrects that error. The correct version of these tables has previously appeared in the Federal Register, so no new obligations or requirements are imposed on any party as a result of this correction.

EFFECTIVE DATE: March 19, 1985.

SUPPLEMENTARY INFORMATION: Standard No. 109, *New Pneumatic Tires—Passenger Cars* (49 CFR §571.109) sets forth a number of performance and labeling requirements which must be satisfied by each new tire for use on passenger cars manufactured after 1948. One of the requirements which those tires must meet is a strength test. Section S4.2.2.4 specifies that each tire shall meet the requirements for minimum breaking energy specified in Table I.

With the introduction of temporary spare tires in the mid-70's, NHTSA published a final rule adding tables specifying the minimum breaking energy for these new tires at 42 FR 12869, March 7, 1977. These tables specified that those tires with a maximum load rating of 880 pounds and above had to have a higher minimum breaking energy than tires with a maximum load rating below 880 pounds. However, the version of these tables published in the Code of Federal Regulations has the respective minimum breaking energy values transposed, so that it appears that the tires with the lower maximum load rating must have the higher breaking energy. This notice corrects that error.

Publication of the correct version of these requirements imposes no duties or obligations on any party, nor does it alter existing obligations. The agency has always used the correct version of these requirements for the purposes of its compliance testing, and the correct version of these requirements was published in the Federal Register. This notice simply ensures that the public will have a correct copy of the requirements of Standard No. 109. Accordingly, the NHTSA finds for good cause that notice and opportunity for comment on this correction are unnecessary, and the correction is effective as soon as this notice is published.

In consideration of the foregoing, 49 CFR §571.109 is amended as follows:

1. Table I-D in Appendix A of §571.109 is revised to read as follows:

TABLE I-D—FOR TIRES WITH 60 LB/IN^2 MAXIMUM PERMISSIBLE INFLATION PRESSURE AND MAXIMUM LOAD RATING OF 880 LB AND ABOVE

Cord Material	Inch pounds
Rayon	1,650
Nylon or polyester	2,600

2. Table I-E in Appendix A of §571.109 is revised to read as follows:

TABLE I-E—FOR TIRES WITH 60 LB/IN^2 MAXIMUM PERMISSIBLE INFLATION PRESSURE AND MAXIMUM LOAD RATING BELOW 880 LB

Cord Material	Inch pounds
Rayon	1,000
Nylon or polyester	1,950

Issued on March 13, 1985.

Diane K. Steed
Administrator

50 FR 10968
March 19, 1985

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 85-09; Notice 02)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standard (FMVSS) No. 109, *New Pneumatic Tires—Passenger Cars,* to delete paragraph S4.2.2.2(b) of the standard. Paragraph S4.2.2.2(b) imposes a size factor dimensional requirement on tires manufactured for passenger cars. The agency has concluded that the size factor requirement provides no safety benefits, and that removing that requirement relieves an unnecessary restriction on tire manufacturers.

EFFECTIVE DATE: May 5, 1986.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard (FMVSS) No. 109, *New Pneumatic Tires—Passenger Cars.* 49 CFR 571.109, specifies the requirements for all tires manufactured for use on passenger cars manufactured after 1948. Under that safety standard, tires must meet specified dimensional, strength, resistance to bead unseating, endurance, and high speed requirements, and be labeled with certain safety information.

The European Tyre and Rim Technical Organisation (ETRTO) petitioned NHTSA to amend Standard No. 109 to delete the size factor requirement in paragraph S4.2.2.2(b). "Size factor" is defined in paragraph S3 of the standard as "the sum of the section width and the outer diameter of a tire determined on the test rim." The basis for ETRTO's request was that size factor provides no safety benefits and should be deleted for the same reasons stated by the agency for deleting the minimum size factor requirement. (*See,* 46 FR 61473, December 17, 1981; 47 FR 36180; August 19, 1982.) NHTSA tentatively agreed that the size factor dimensional requirement provides no safety benefits and issued a notice on July 12, 1985 (50 FR 28426), granting ETRTO's petition and proposing to delete the size factor requirement.

Background

A rule published in December 1981, deleted an informational table (referred to as "Table 1") that had been included in FMVSS No. 109 to list dimensional and loading information for all passenger car tire sizes, including dimensional specifications for "minimum size factor." The information had been used by the agency for testing tires for compliance with FMVSS No. 109 and for determining the appropriateness of the tires used on particular vehicles, in accordance with FMVSS No. 110, *Tire Selection and Rims.* NHTSA determined that retaining Table 1 was not necessary because the required specifications for compliance testing could be determined from the information labeled on the sidewall of the tires, and because no safety-related justifications for keeping the table were found to exist.

In deleting Table 1 from Standard No. 109, NHTSA intended to reduce unnecessary paperwork burdens for manufacturers and facilitate the introduction of new technology in tires, and thus amended the standard's requirements for tire sizes and load factors to reference publications of private standards groups. Commenters to the NPRM on this action had requested the agency to delete the dimensional requirements of Standard No. 109 in its final rule, but NHTSA determined that those requests could not be considered since the public was not given an opportunity to comment on such a change. NHTSA thus issued the final rule which amended S4.2.2.2 to simply delete reference to Table 1 and instead include the new references to the private publications.

Since dimensional requirements were being retained in S4.2.2.2, several commenters were concerned that some of the standardization organizations do not publish the size factor dimension. NHTSA addressed this concern by explaining that all yearbooks specify a tire's overall diameter and section width, and that added together, those dimensions equal the size factor. However, when Table 1 was deleted from Standard No. 109, NHTSA should have distinguished between specifications referring to "size factor" and those which had referred previously to "minimum size factor." As explained below, this oversight resulted in an unintended removal of dimensional tolerances previously permitted by the standard.

Size factor

Prior to the deletion of Table 1, paragraph S4.2.2.2(b) of the standard had required that a tire's size factor be *at least as large* as the size factor provided by the table. Accordingly, a "minimum size factor" was specified in Table 1 for each tire size designation. The minimum size factor for a particular tire size was always less than the size factor of that tire. A tire could meet the size factor dimensional requirement of FMVSS No. 109 when its size factor was equal to on greater than the size factor provided by Table 1 for its size designation. (For example, according to data from the 1982 Tire and Rim Association Yearbook, the size factor for the tire listed as P195/75R14 is 33.23 inches, while its minimum size factor is calculated as 32.64 inches.)

When the agency deleted Table 1, NHTSA removed Standard No. 109's listing of minimum size factors for tire sizes. NHTSA determined that the requirement was no longer necessary because manufacturers would not undersize their tires absent such a requirement. The agency amended the standard to require that a tire's size factor be at least as large as that specified in a submission made by an individual manufacturer to NHTSA, pursuant to the requirements of paragraph S4.4.1(a) of the standard, or in one of the standardization organization's publications described in S4.4.1(b), for the tire's size designation and type. However, since size factor is simply the sum of the section width and the outer diameter of a tire and is actually a design goal, the unintended effect of specifying that a tire's size factor be "at least as large as" that specified in a publication or yearbook was to revise S4.2.2.2(b) to remove the dimensional tolerances previously permitted by the minimum size factors provided in Table 1.

ETRTO's petition

When the agency denied petitions for reconsideration of its decision to delete the minimum size factor requirement, NHTSA reiterated its conclusion that such a requirement was not needed in Standard No. 109. (47 FR at 36181). ETRTO subsequently petitioned the agency to delete or amend S4.2.2.2(b) to accord with NHTSA's determination that a dimensional requirement for tire size factor was unnecessary and "to avoid any confusion" regarding that matter. NHTSA granted the petition and issued an NPRM proposing to remove paragraph S4.2.2.2(b) from Standard No. 109 and the definition of "size factor" from paragraph S3 (50 FR 28426; July 12, 1985).

The July 1985 NPRM explained that the size factor requirement should be deleted for the same reasons that minimum size factor was deleted. As explained in that notice, the agency tentatively determined that there were no safety benefits to retaining the size factor requirement since it would be implausible that tire manufacturers would either intentionally or inadvertently undersize their passenger car tires, due to the engineering and quality control efforts that are involved in designing and producing new tire sizes. First, the size factor of a tire cannot be changed after the mold is set up to produce that tire size. Second, tire manufacturers are required to certify that their tires can carry 100 percent of its maximum load at a speed of 50 miles per hour for 24 hours. Undersized tires would be overloaded and would predictably have a high failure rate during this test, which would alert tire manufacturers and NHTSA to any undersizing. Further, product liability awards and negative publicity would more than offset the few dollars saved by undersizing, and would serve as compelling disincentives to manufacturers. Finally, NHTSA believed that the size factor requirement was unnecessary because the absence of such a requirement in Safety Standard No. 119, which applies to tires for use on all motor vehicles other than passenger cars, had not created any problems. Accordingly, since NHTSA believed that tire manufacturers would not intentionally or inadvertently produce a tire which was smaller than the size labelled on the sidewall, the agency proposed to delete the size factor requirement as a means of relieving an unnecessary restriction on tire manufacturers.

Comments

The agency received four comments on the proposal. Ford agreed that the size factor requirement provides no safety benefits and should therefore be deleted from Standard No. 109, while Volkswagen, BMW, and Daimler-Benz AG (Mercedes-Benz) opposed the proposal.

Volkswagen (VW) argued that deleting the size factor requirement would eliminate one of the last constraints on tire manufacturers. VW cited examples of identical tires being marked with different sizes due to the overlap between maximum and minimum dimensions. That company believed that the performance requirements of Standard No. 109 do not represent a safeguard against undersizing of tire section width, so that tire manufacturers could continue to designate a tire in different ways which can enable them to charge unjustified premiums for certain tires marked with larger sizes. VW suggested NHTSA adopt lower tolerance limits for tire section width.

In response to this comment, NHTSA believes that motor vehicle manufacturers must use their own expertise in tire selection to comply with both FMVSS No. 109 and FMVSS No. 110. The practices of some tire manufacturers to supply identical tires at different prices is one which can occur regardless of the size factor requirement in Standard No. 109. Since there are means available to motor vehicle manufacturers to guard against those types of actions, NHTSA has concluded that VW has not provided a sufficient basis for retaining the size factor requirement.

BMW believed that the agency should not limit its consideration of undersized tires to tire strength and durability. BMW urged NHTSA to consider that tire size affects drivability, braking and steering, and is dependent on wheelwell clearances, and that tire revolutions per mile affect speedometer and odometer accuracy, noise and exhaust emission and fuel economy. That commenter also believed that a minimum dimensional requirement is necessary in light of the use of aftermarket tires, and that, given the entry of other countries into tire production, "compliance with some existing voluntary size standard could become a nebulous quantity."

NHTSA agrees that the factors cited by BMW can be affected by tire size. However, the agency believes that the effect, if any, would not be significant. Further, there is no reason to believe that manufacturers will produce tires which do not accord with their labeled sizes.

In their petitions for reconsideration of NHTSA's decision to remove the minimum size factor requirement, commenters argued that, absent a minimum size factor requirement, it would be possible for manufacturers to undersize their tires. The agency did not agree that manufacturers will undersize their tires absent a minimum size factor requirement, and explained its decision in the following manner:

> The size factor of a tire cannot change after the mold is set up to begin producing that size of tire. With all of the engineering and quality control effort involved in designing and producing new tire sizes, it is simply implausible that a tire manufacturer would either intentionally or inadvertently undersize the molds. The undersized tires that would be produced might save the manufacturers a few dollars per tire, but the savings would be more than offset by product liability awards and negative publicity generated. Since automobile manufacturers design cars to a tire's rated load, undersized tires would be overloaded on those cars, and would predictably exhibit higher failure rates than properly sized tires made by other manufacturers. This appears to be a very compelling disincentive to undersizing tires. Hence, the agency concludes that the minimum size factor is not needed in Standard No. 109. (47 FR at 36181; August 19, 1982.)

The agency has concluded that the rationale against undersizing is still valid. Therefore, NHTSA does not agree with BMW that tire undersizing by after-market or foreign tire manufacturers might occur absent a size factor requirement.

Daimler-Benz AG (DBAG) agreed with NHTSA that it is highly improbable that tires with insufficient load carrying capacities will be produced, even in the absence of a size factor requirement. However, that company believed that future tires will have less width than current tires if the size factor requirement were deleted. Although DBAG acknowledged that this might not necessarily result in a direct safety hazard with respect to tire strength and endurance, that commenter was concerned about decreases in tire width. DBAG believed that, since the wheelwell spaces have to be determined on the basis of the largest possible dimensions of the designated tire size, narrower tires in set wheelwells might not be esthetically pleasing to customers. Customers might therefore replace their original tires with larger sizes which could interfere with the surrounding body and suspension parts. DBAG was also concerned that customer cost and dissatisfaction could increase if smaller tires were produced, since smaller tires tend to wear more rapidly.

NHTSA does not agree that customers will purchase tires that are oversized for their vehicles. FMVSS No. 110 requires that consumers be informed of recommended tire sizes for their vehicles, to ensure that existing tires are not replaced with tires of sizes not recommended for a particular vehicle. Further, the agency believes that tire dealers will exercise great care in order to avoid tort liability for selling incompatible tires.

NHTSA has concluded that the size factor requirement in Standard No. 109 provides no safety benefits. The agency has concluded that removing size factor not only relieves an unnecessary restriction on tire manufacturers but also recognizes that mass-produced products have some minor product-to-product variations, and that these variations can be perfectly acceptable. Therefore, NHTSA is amending FMVSS No. 109 to delete S4.2.2.2(b), and the definition of "size factor" from paragraph S3.

Effective date

The changes to Standard No. 109 described herein are effective upon publication of this rule in the *FEDERAL REGISTER*. These changes relieve a restriction on tire manufacture which the agency has determined to be unnecessary. The revisions to the standard do not specify different test procedures or additional requirements, and no leadtime for preparation by tire or vehicle manufacturers is required. NHTSA therefore finds good cause for making these changes effective upon publication of this final rule in the *Federal Register*.

In consideration of the foregoing, 49 CFR Part 571 is amended as follows:

1. Paragraph S3 is amended by removing the following paragraph:

"Size Factor" means the sum of the section width and the outer diameter of a tire determined on the test rim.

2. Paragraph S4.2.2.2 is amended by revising it to read as follows:

S4.2.2.2 Physical Dimensions. The actual section width and overall width for each tire measured in accordance with S5.1, shall not exceed the section width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a) or in one of the publications described in S4.4.1(b) for its size designation and type by more than:

(1) (For tires with a maximum permissible inflation pressure of 32, 36, or 40 psi) 7 percent, or

(2) (For tires with a maximum permissible inflation pressure of 60 psi or 240, 280, or 300kPa) 7 percent or 0.4 inch, whichever is larger.

Issued on: April 29, 1986

Diane K. Steed
Administrator

51 F.R. 16517
May 5, 1986

MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

S1. Scope. This standard specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance, and high-speed performance; defines tire load ratings; and specifies labeling requirements for passenger car tires.

S2. Application. This standard applies to new pneumatic tires for use on passenger cars manufactured after 1948. However, it does not apply to any tire which has been altered so as to render impossible its use, or its repair for use, as motor vehicle equipment.

S3. Definitions.

"Bead" means that part of the tire made of steel wires, wrapped or reinforced by ply cords, that is shaped to fit the rim.

"Bead separation" means a breakdown of bond between components in the bead area.

"Bias ply tire" means a pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90° to the centerline of the tread.

"Carcass" means the tire structure, except tread and sidewall rubber.

"Chunking" means the breaking away of pieces of the tread or sidewall.

"Cord" means the strands forming the plies in the tire.

"Cord separation" means cord parting away from adjacent rubber compounds.

"Cracking" means any parting within the tread, sidewall, or innerliner of the tire extending to cord material.

"Groove" means the space between two adjacent tread ribs.

"Innerliner" means the layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

"Innerliner separation" means the parting of the innerliner from cord material in the carcass.

"Load rating" means the maximum load a tire is rated to carry for a given inflation pressure.

"Maximum permissible inflation pressure" means the maximum cold inflation pressure to which a tire may be inflated.

"Maximum load rating" means the load rating at the maximum permissible inflation pressure for that tire.

"Open splice" means any parting at any junction of tread, sidewalls, or innerliner that extends to cord material.

"Overall width" means the linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

"Ply" means a layer of rubber-coated parallel cords.

"Ply separation" means a parting of rubber compound between adjacent plies.

"Pneumatic tire" means a mechanical device made of rubber, chemicals, fabric and steel or other materials, which, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

"Radial ply tire" means a pneumatic tire in which the ply cords which extend to the beads are laid at substantially 90° to the centerline of the tread.

"Rim" means a metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

"Section width" means the linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

"Sidewall" means that portion of a tire between the tread and the bead.

"Sidewall separation" means the parting of the rubber compound from the cord material in the sidewall.

"Test rim" means, with reference to a tire to be tested, any rim that is listed as appropriate for use with that tire in accordance with S4.4. For purposes of this section and § 571.110 of this chapter, each rim listing shall include dimensional specifications and a diagram of the rim.

"Tread" means that portion of a tire that comes into contact with the road.

"Tread rib" means a tread section running circumferentially around a tire.

"Tread separation" means pulling away of the tread from the tire carcass.

S4. Requirements.

S4.1 Size and Construction. Each tire shall be designed to fit each rim specified for its size designation in each reference cited in the definition of "test rim" in S.3.

S4.2 Performance requirements.

S4.2.1 General. Each tire shall conform to each of the following:

(a) It shall meet the requirements specified in S4.2.2 for its tire size designation, type, and maximum permissible inflation pressure.

(b) Its maximum permissible inflation pressure shall be either 32, 36, 40, or 60 psi, or 240, 280, or 300 kPa.

(c) Its load rating shall be that specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for its size designation, type and each appropriate inflation pressure. If the maximum load rating for a particular tire size is shown in more than one of the publications described in S4.4.1(b), each tire of that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing maximum load ratings for the same tire size designation, not less than the lowest published maximum load rating.

(d) If manufactured on or after August 1, 1968, it shall incorporate a tread wear indicator that will provide a visual indication that the tire has worn to a tread depth of $\frac{1}{16}$ inch.

(e) It shall, before being subjected to either the endurance test procedure specified in S5.4 or the high-speed performance test procedure specified in S5.5, exhibit no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking or open splices.

(f) It shall meet the requirements of S4.2.2..5 and S4.2.2.6 when tested on a test wheel described in S5.4.2.1 either alone or simultaneously with up to 5 other tires.

S4.2.2 Test requirements.

S4.2.2.1 Test sample. For each test sample use—

(a) One tire for physical dimensions, resistance to bead unseating, and strength, in sequence;

(b) Another tire for tire endurance; and

(c) A third tire for high-speed performance.

S4.2.2.2 Physical Dimensions. [The actual section width and overall width for each tire measured in accordance with S5.1, shall not exceed the section width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a) or in one of the publications described in S4.4.1(b) for its size designation and type by more than:

(1) (For tires with a maximum permissible inflation pressure of 32, 36, or 40 psi) 7 percent, or

(2) (For tires with a maximum permissible inflation pressure of 60 psi or 240, 280, or 300 kPa) 7 percent or 0.4 inches, whichever is larger. (51 F.R. 16517—May 5, 1986. Effective: May 5, 1986)]

Its size factor shall be at least as large as that specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for its size designation and type.

S4.2.2.3 Tubeless tire resistance to bead unseating.

S4.2.2.3.1 When a tubeless tire that has a maximum inflation pressure other than 60 psi is tested in accordance with S5.2, the applied force required to unseat the tire bead at the point of contact shall be not less than:

(a) 1500 pounds for tires with a designated section width of less than six (6) inches;

(b) 2000 pounds for tires with a designated section width of six (6) inches or more, but less than eight (8) inches;

(c) 2,500 pounds for tires with a designated section width of eight (8) inches or more, using the section width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for the applicable tire size designation and type.

S4.2.2.3.2 When a tire that has a maximum inflation pressure of 60 psi is tested in accordance with S5.2, the applied force required to unseat the tire bead at the point of contact shall be not less than:

(a) 1500 pounds for tires with a maximum load rating of less than 880 pounds;

(b) 2000 pounds for tires with a maximum load rating of 880 pounds or more but less than 1400 pounds;

[(c) 2,500 pounds for tires with a maximum load rating of 1,400 pounds or more, using the maximum load rating marked on the sidewall of the tire. (47 F.R. 36180—August 19, 1982. Effective: August 19, 1982)]

S4.2.2.4 Tire strength. Each tire shall meet the requirements for minimum breaking energy specified in Table I when tested in accordance with S5.3.

S4.2.2.5 Tire endurance. When the tire has been subjected to the laboratory endurance test specified in S5.4, using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressure specified in S5.4.1.1.

S4.2.2.6 High-speed performance. When the tire has been subjected to the laboratory high-speed performance test specified in S5.5, using a test rim that undergoes no permanent deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber, the tire shall meet the requirements set forth in S4.2.2.5(a) and (b).

S4.3 Labeling requirements. Except as provided in S4.3.1 and S4.3.2 each tire shall have permanently molded into or onto both sidewalls, in letters and numerals not less than 0.078 inches high, the information shown below in (a) through (g). On at least one sidewall, the information shall be positioned in an area between the maximum section width and bead of the tire. However, in no case shall the information be positioned on the tire so that it is obstructed by the flange of any rim designated for use with that tire in Standard Nos. 109 and 110 (571.109 and 571.110 of this part).

(a) One size designation, except that equivalent inch and metric size designations may be used;

(b) Maximum permissible inflation pressure;

(c) Maximum load rating;

(d) The generic name of each cord material used in the plies (both sidewall and tread area) of the tire;

(e) Actual number of plies in the sidewall, and the actual number of plies in the tread area if different;

(f) The words "tubeless" or "tube type" as applicable; and

(g) The word "radial" if the tire is a radial ply tire.

S4.3.1 Each tire shall be labeled with the symbol DOT in the manner specified in Part 574 of this chapter, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards.

S4.3.2 Each tire shall be labeled with the name of the manufacturer, or brand name and number assigned to the manufacturer in the manner specified in Part 574.

S4.3.3 Each tire manufactured between March 1, 1971, and May 22, 1971, shall either—

(a) Comply with S4.3(d) (2) and S4.3(i) (as effective until May 22, 1971); or

(b) Be labeled with the tire identification number required by Part 574.5 of this chapter and comply with S4.3.1 and S4.3.2 (as effective on and after May 22, 1971).

S4.3.4 If the maximum inflation pressure of a tire is 240, 280, or 300 kPa then:

(a) Each marking of that inflation pressure pursuant to S4.3(b) shall be followed in parenthesis by the equivalent inflation pressure in psi, rounded to the next higher whole number; and

(b) Each marking of the tire's maximum load rating pursuant to S4.3(c) in kilograms shall be followed in parentheses by the equivalent load rating in pounds, rounded to the nearest whole number.

S4.3.5 If the maximum inflation pressure of a tire is 60 psi, the tire shall have permanently molded into or onto both sidewalls, in letters and numerals not less than ½ inch high, the words "Inflate to 60 psi." On both sidewalls, the words shall be positioned in an area between the tire shoulder and the bead of the tire. However, in no case shall the words be positioned on the tire so that they are obstructed by the flange of any rim designated for use with that tire in this standard or in Standard No. 110 (§ 571.110 of this part).

S4.4 Tire and rim matching information.

S4.4.1 Each manufacturer of tires shall ensure that a listing of the rims that may be used with each tire that he produces is provided to the public. A listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or diagram of a rim if the rim's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b). The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Office of Vehicle Safety Standards, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; or

(b) Contained in publications, current at the date of manufacture or any later date, of at least one of the following organizations:

[The Tire and Rim Association.
The European Tyre and Rim Technical Organisation.
Japan Automobile Tire Manufacturers' Association, Inc.
Deutsche Industrie Norm
British Standards Institution
Scandinavian Tire and Rim Organization

(48 F.R. 25209—June 6, 1983. Effective: June 6, 1983)]

S4.4.2 Information contained in any publication specified in S4.4.1(b) which lists general categories of tires and rims by size designation, type of construction and/or intended use, shall be considered to be manufacturer's information pursuant to S4.4.1 for the listed tires and rims, unless the publication itself or specific information provided according to S4.4.1(a) indicates otherwise.

S5. Test procedures.

S5.1 Physical Dimensions. Determine tire physical dimensions under uniform ambient conditions as follows:

(a) Mount the tire on a test rim having the test rim width specified in a submission made by an individual manufacturer, pursuant to S4.4.1(a), or in one of the publications described in S4.4.1(b) for that tire size designation and inflate it to the applicable pressure specified in Table II.

(b) Condition it at ambient room temperature for at least 24 hours.

(c) Readjust pressure to that specified in (a).

(d) Caliper the section width and overall width at six points approximately equally spaced around the tire circumference.

(e) Record the average of these measurements as the section width and overall width, respectively.

(f) Determine tire outer diameter by measuring the maximum circumference of the tire and dividing this dimension by pi (3.14).

S5.2 Tubeless tire bead unseating resistance.

S5.2.1 Preparation of tire-wheel assembly.

S5.2.1.1 Wash the tire, dry it at the beads, and mount it without lubrication or adhesives on a clean, painted test rim.

S5.2.1.2 Inflate it to the applicable pressure specified in Table II at ambient room temperature.

S5.2.1.3 Mount the wheel and tire in the fixture shown in Figure 1, and force the bead unseating block shown in Figure 2 or Figure 2A against the tire sidewall as required by the geometry of the fixture. However, in testing a tire that has an inflation pressure of 60 psi, only use the bead unseating block described in Figure 2A.

S5.2.2 Test procedure.

S5.2.2.1 Apply a load through the block to the tire outer sidewall at the distance specified in Figure 1 for the applicable wheel size at a rate of 2 inches per minute, with the load arm substantially parallel to the tire and rim assembly at the time of engagement.

S5.2.2.2 Increase the load until the bead unseats or the applicable value specified in S4.2.2.3 is reached.

S5.2.2.3 Repeat the test at least four places equally spaced around the tire circumference.

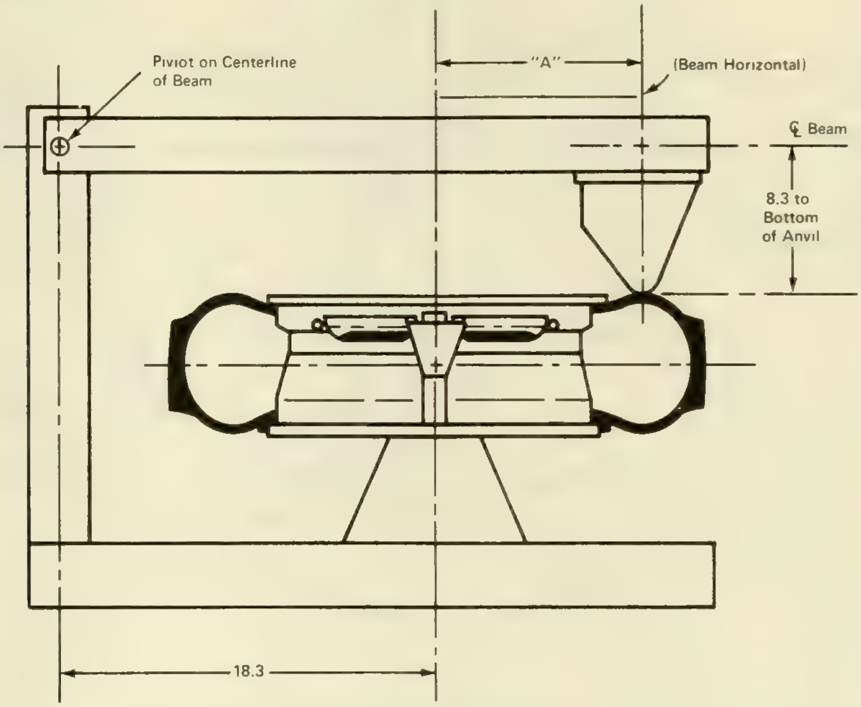
S5.3 Tire strength.

S5.3.1 Preparation of tire.

S5.3.1.1 Mount the tire on a test rim and inflate it to the applicable pressure specified in Table II;

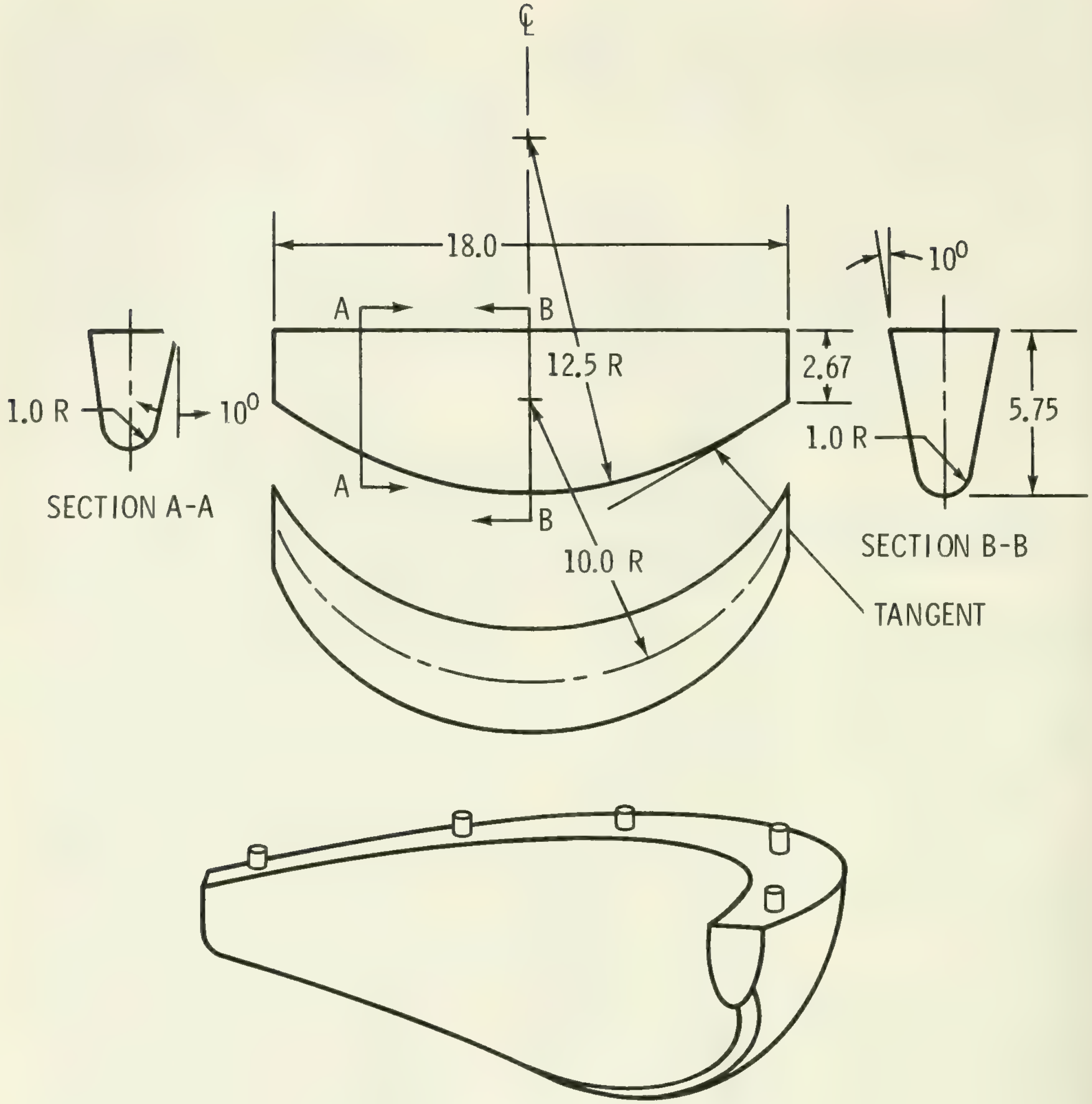
S5.3.1.2 Condition it at room temperature for at least 3 hours; and

S5.3.1.3 Readjust its pressure to that specified in S5.3.1.1.



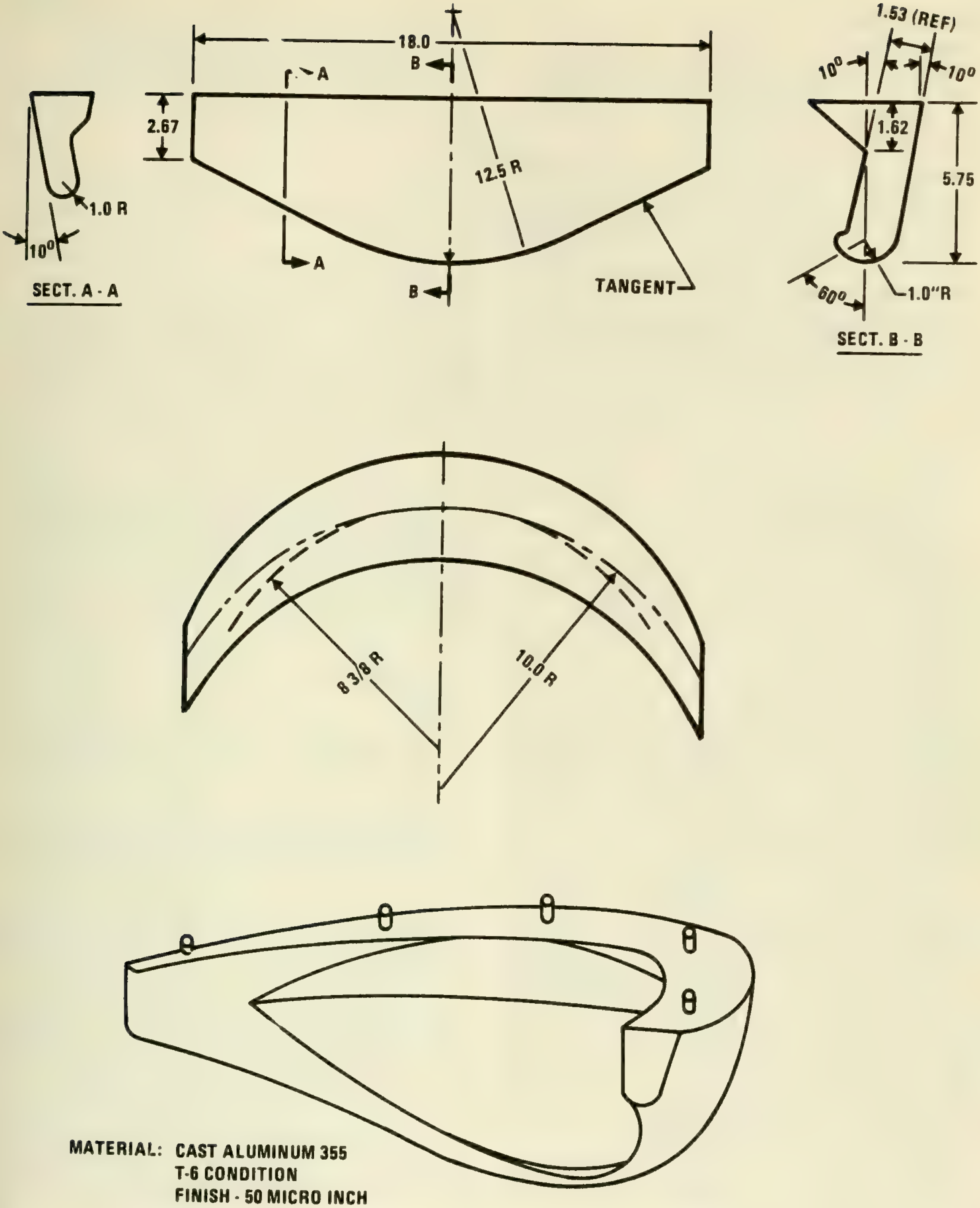
Wheel Size	*Dimension "A" for tires with maximum inflation pressure*	
	Other than 60 lb/in²	*60 lb/in²*
17″	12.0″	—
16″	11.5″	9.9″
15″	11.0″	9.4″
14″	10.5″	8.9″
13″	10.0″	8.4″
12″	9.5″	—
11″	9.0″	—
10″	8.5″	—
320 mm	8.50″	
340 mm	9.00″	
345 mm	9.25″	
365 mm	9.75″	
370 mm	10.00″	
390 mm	11.00″	
415 mm	11.50″	

Figure 1—Bead Unseating Fixture—Dimesions in Inches



MATERIAL: Cast Aluminum 355
T-6 Condition
Finish-50 Micro Inch

FIGURE 2—Diagram of Bead Unseating Block Dimensions in Inches



MATERIAL: CAST ALUMINUM 355
T-6 CONDITION
FINISH - 50 MICRO INCH

FIGURE 2A—Diagram of Bead Unseating Block Dimensions in Inches

S5.3.2 Test procedure.

S5.3.2.1 Force a ¾-inch-diameter cylindrical steel plunger with a hemispherical end perpendicularly into the tread rib as near to the centerline as possible, avoiding penetration into the tread groove, at the rate of 2 inches per minute.

S5.3.2.2 Record the force and penetration at five test points equally spaced around the circumference of the tire. If the tire fails to break before the plunger is stopped by reaching the rim, record the force and penetration as the rim is reached and use these values in S5.3.2.3.

S5.3.2.3 Compute the breaking energy for each test point by means of the following formula:

$$W = \frac{F \times P}{2}$$

where

W = Energy, inch-pounds;
F = Force, pounds; and
P = Penetration, inches.

S5.3.2.4 Determine the breaking energy value for the tire by computing the average of the five values obtained in accordance with S5.3.2.3.

S5.4 Tire endurance.

S5.4.1 Preparation of tire.

S5.4.1.1 Mount a new tire on a test rim and inflate it to the applicable pressure specified in Table II.

S5.4.1.2 Condition the tire assembly to 100 ± 5°F. for at least three hours.

S5.4.1.3 Readjust tire pressure to that specified in S5.4.1.1 immediately before testing.

S5.4.2 Test procedure.

S5.4.2.1 Mount the tire and wheel assembly on a test axle and press it against a flat-faced steel test wheel 67.23 inches in diameter and at least as wide as the section width of the tire to be tested or an approved equivalent test wheel, with the applicable test load specified in the table in S5.4.2.3 for the tire's size designation, type, and maximum permissible inflation pressure.

S5.4.2.2 During the test, the air surrounding the test area shall be 100 ± 5°F.

S5.4.2.3 Conduct the test at 50 miles per hour in accordance with the following schedule without pressure adjustment or other interruptions:

[The loads for the following periods are the specified percentage of the maximum load rating marked on the tire sidewall:

	Percent
4 hours	85
6 hours	90
24 hours	100

(46 F.R. 61473—December 17, 1981. Effective: 6/16/82)]

S5.4.2.4 Immediately after running the tire the required time, measure its inflation pressure. Allow the tire to cool for one hour. Then deflate the tire, remove it from the test rim, and inspect it for the conditions specified in S4.2.2.5(a).

S5.5 High-speed performance.

S5.5.1 [After preparing the tire in accordance with S5.4.1, mount the tire and wheel assembly in accordance with S5.4.2.1, and press it against the test wheel with a load of 88 percent of the tire's maximum load rating as marked on the tire sidewall. (46 F.R. 61473—December 17, 1981. Effective: 6/16/82)]

S5.5.2 Break in the tire by running it for 2 hours at 50 mph.

S5.5.3 Allow it to cool to 100 ± 5°F and readjust the inflation pressure to the applicable pressure specified in Table II.

S5.5.4 Without readjusting inflation pressure, test at 75 mph for 30 minutes, 80 mph for 30 minutes, and 85 mph for 30 minutes.

S5.5.5 Immediately after running the tire the required time, measure its inflation pressure. Allow the tire to cool for one hour. Then deflate the tire, remove it from the test rim, and inspect it for the conditions specified in S4.2.2.5(a).

S6. Nonconforming tires. [No tire that is designed for use on passenger cars and manufactured on or after October 1, 1972, but does not conform to all the requirements of this standard, shall be sold, offered for sale, introduced or delivered for introduction into interstate commerce, or imported into the United States, for any purpose. (46 F.R.61473—December 17, 1981. Effective: 6/16/82)]

APPENDIX A

GUIDELINES FOR ABBREVIATED RULEMAKING PROCEDURE FOR ADDING TIRE SIZES TO STANDARD NO. 109

Tables I–A through I–J of Standard No. 109, as amended (33 F.R. 5946–5949) are deleted and in their places the following is inserted:

The following tables list tire sizes and tire constructions with proper load and inflation values. The tables group tires of related construction and load/inflation values. Persons requesting the addition of new tire sizes to the tables or the addition of tables for new tire construction may, when the additions requested are compatible with existent groupings, or when adequate justification for new tables exists, submit five (5) copies of information and data supporting the request to the Secretary of Transportation, Attention: Motor Vehicle Programs, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590.

The information should contain but not be limited to the following:

(1) The tire size designation and whether the tire is an addition to a category of tires listed in the tables, or a new category for which a table has not been developed.

(2) The tire dimensions, including aspect ratio, size factor, section width, overall width and test rim size.

(3) The load-inflation schedule of the tire.

(4) A statement as to whether the tire size designation and load inflation schedule has been coordinated with an organization such as The Tire and Rim Association, The European Tyre and Rim Technical Organization, The Society of Manufacturers and Traders Limited and the Japan Automobile Tire Manufacturers Association, whose purpose is to standardize tire and rim sizes.

(5) Copies of test data sheets showing test conditions, results and conclusions obtained for individual tests specified in FMVSS No. 109.

(6) Justification for the additional tire sizes.

The addition of new size tires to the tables, or the addition of tables for new tire construction, is accomplished through an abbreviated procedure consisting of the publication in the *Federal Register* of the petitioned tire sizes or tables. If no comments are received, the amendment becomes effective after 30 days from the date of publication. If comments objecting to amendment are received, additional rule making pursuant to Part 353 of the Procedural Rules for Motor Vehicle Safety Standards will be considered.

Amendments to Appendix A of Standard No. 109 may be issued by the Director of Motor Vehicle Programs, National Highway Traffic Safety Administration.

33 F.R. 14964
October 5, 1968

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 69–30; Notice No. 1)

On October 5, 1968, the Federal Highway Administration published guidelines in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A of Standard No. 109 and the Appendix A of Standard No. 110. These guidelines provided an abbreviated rule-making procedure for adding tire sizes to Standard No. 109 and alternative rim sizes to Standard No. 110, whereby the addition becomes effective 30 days from date of publication in the *Federal Register* if no objections to the proposed additions are received. If comments objecting to the amendment warrant, rule making pursuant to the rule making procedures for motor vehicle safety standards (49 CFR 353) will be followed.

The European Tyre and Rim Technical Organisation has petitioned for the addition of the new "Millimeter 70 Series" radial ply tires and the new "Low Section" radial ply tires to Table I of Appendix A of Standard No. 109 and the appropriate test and alternative rims to Table I of Appendix A of Standard No. 110. Also, the Toyota Motor Company, Ltd. has petitioned for the addition of the 5–K alternative rim size for the 165R15 tire size designation to Table 1 of Appendix A of Standard No. 110.

On the basis of the data submitted by the European Tyre and Rim Technical Organisation and the Toyota Motor Company, Ltd., indicating compliance with the requirements of Federal Motor Vehicle Safety Standard No. 109 and No. 110 and other information submitted in accordance with the procedural guidelines set forth, Appendix A of Federal Motor Vehicle Safety Standard No. 109 is being amended and Table I of Appendix A of Standard No. 110 is being amended.

In consideration of the foregoing, Section 371.21 of Part 371 Federal Motor Vehicle Safety Standards, Appendix A of Standards No. 109 (33 F.R. 14964) and Appendix A of Standard No. 110 (34 F.R. 16102) are being amended as set forth below effective 30 days from date of publication in the *Federal Register.*

These amendments are issued under authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1392, 1407), and delegation from the Secretary of Transportation contained in § 1.4(c) of Part 1 of the Regulations of the Office of the Secretary (49 CFR 1.4(c)), and the delegation from the Federal Highway Administrator of October 5, 1968 (33 F.R. 14964).

H. M. Jacklin, Jr.
Acting Director

Motor Vehicle Safety Performance Service

34 F.R. 14376
September 13, 1969

APPENDIX A—FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

The following tables list tire sizes and tire constructions with proper load and inflation values. The tables group tires of related constructions and load/inflation values. Persons requesting the addition of new tire sizes to the tables or the addition of tables for new tire constructions may, when the additions requested are compatible with existent groupings, or when adequate justification for new tables exists, submit five (5) copies of information and data supporting the request to the Secretary of Transportation, Attention: Motor Vehicle Programs, National Highway Traffic Safety Administration, U.S. Department of Transportation, Washington, D.C. 20590.

The information should contain the following:

1. The tire size designation, and a statement that the tire is an addition to a category for which a table has not been developed.

2. The tire dimensions, including aspect ratio, size factor, section width, overall width, and test rim size.

3. The load-inflation schedule of the tire.

4. A statement that the tire size designation and load inflation schedule has been coordinated with the Tire and Rim Association, the European Tyre and Rim Technical Organisation, the Society of Manufacturers and Traders Limited, the Japan Automobile Tire Manufacturers Association, the Deutsche Industrie Norm and the Scandinavian Tire and Rim Organization.

5. Copies of test data sheets showing test conditions, results and conclusions obtained for individual tests specified in Federal Motor Vehicle Safety Standard No. 109.

6. Justification for the additional tire sizes.

The addition of new size tires to the tables, or the addition of tables for new tire construction, is accomplished through an abbreviated procedure consisting of publication in the *Federal Register* of the petitioned tire sizes or tables. If no comments are received, the amendment becomes effective 30 days from the date of publication. If objections to the amendment are received, additional rulemaking pursuant to Part 553 of the procedural rules for Motor Vehicle Safety Standards will be initiated.

36 F.R. 8298
May 4, 1971

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71-9; Notice No. 1)

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14969) by which routine additions of tire and rim sizes could be added to Appendix A of Standard No. 109 and to Appendix A of Standard No. 110. Under these guidelines, the addition becomes effective 30 days from the date of its publication in the *Federal Register*, if no objections to the proposed additions are received. If objections to the amendment are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR Part 553) are followed. Numerous additions to Appendix A of Standard 109 and Appendix A of Standard 110 have been made under these procedures, and Appendix A of Standard No. 109 and Appendix A of Standard No. 110 are being reissued at this time to incorporate all the changes that have been made to these appendices since October 5, 1968.

At the top of each table in the appendices there is an amendment number that indicates the number of times the table has been amended since its original issue. Where feasible, a brief note below the table indicates the substance of the change being made. This procedure will be followed in future amendments to the tables.

In addition to republishing all previous additions to the tables, new tire size designations and alternative rims are hereby added to various tables. The European Tyre and Rim Technical Organisation has petitioned for the addition of 140 R 12 and 6.5-13 as tire size designations in Appendix A of Standard No. 109, and has requested that test and alternate rim(s) for these tires be added to Appendix A of Standard No. 110.

The European Tyre and Rim Technical Organisation has also petitioned for the addition of the following alternative rims to Table I—Appendix A of Standard No. 110.

Tire size designation:	*Alternative rim*
175-13/6.95-13	5½-J.
6.2-13	4½-J.
205 R 14	7½-K.
205 R 15	6½-L.

In addition to the above, the following errors in the tables have been brought to the National Highway Traffic Safety Administration's attention and are hereby corrected:

(a) Standard No. 109—Appendix A—Table I-B. The 26-pound inflation pressure maximum load for the A70-13 tire size designation is changed to read "940".

(b) Standard No. 110—Appendix A—Table I. The alternate rim "5½-J" of the 6.40-15 tire size in section Table I-C is corrected to read "5½-JJ".

In consideration of the foregoing, § 571.21 of Part 571, Federal Motor Vehicle Safety Standards, Appendix A of Standard No. 109 and Appendix A of Standard No. 110 are amended . . . effective 30 days from date of publication in the *Federal Register.*

Issued on April 16, 1971.

Rodolfo A. Diaz,
Acting Associate Administrator,
Motor Vehicle Programs

36 F.R. 8298
May 4, 1971

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71-12; Notice No. 1)

This amendment adds certain tire sizes and alternative rim sizes to the passenger car tire standard and the tire selection and rim standard.

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109 and to Appendix A, Standard No. 110. Under these guidelines, the addition becomes effective 30 days from date of publication in the *Federal Register*, if no objections to the proposed additions are received. If objections to the amendment are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR 553) are followed. All changes made to the appendices as of April 16, 1971 were reissued and incorporated into the tables and republished in the *Federal Register* of May 4, 1971 (36 F.R. 8298).

The Rubber Manufacturers Association has petitioned for the addition of the new AR78-13, CR78-13, D78-13, DR70-13, BR78-14, CR70-14, E60-14, H60-14, A78-15, AR78-15, and HR60-15 tire size designations to Table I, Appendix A of Standard No. 109 and the appropriate test and alternative rims to Table I, Appendix A of Standard No. 110.

The Rubber Manufacturers Association has also petitioned for the addition of the 6-JJ alternative rim size for the JR70-15 and LR70-15 tire size designations; the 8-JJ alternative rim size for the FR60-15 and GR60-15 tire size designations and the 4-JJ alternative rim size for the 175R13 tire size designation to Table I, Appendix A of Standard No. 110.

The European Tyre and Rim Technical Organisation has petitioned for the addition of the 8½-L and 8-K alternative rims for the GP70-15 tire size designation to Table I, Appendix A of Standard No. 110.

The Ford Motor Company has petitioned for the addition of the 5½-JJ alternative rim size for the 175R13 tire size designation to Table I, Appendix A of Standard No. 110.

On the basis of the data submitted by the Rubber Manufacturers Association, the European Tyre and Rim Technical Organisation, and the Ford Motor Company indicating compliance with the requirements of Federal Motor Vehicle Safety Standards No. 109 and No. 110 and other information submitted in accordance with the procedural guidelines set forth, Table I, Appendix A of Standard No. 109 is being amended and Table I, Appendix A of Standard No. 110 is being amended.

In consideration of the foregoing, § 571.21 of Part 571 Federal Motor Vehicle Safety Standards, Appendix A of Standard No. 109 and Appendix A of Standard No. 110 are amended to read as set forth below, effective 30 days from date of publication in the *Federal Register.*

Issued on May 24, 1971.

Robert L. Carter
Acting Associate Administrator
Motor Vehicle Programs

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36 F.R. 10733
June 2, 1971

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–16; Notice No. 1)

This amendment adds certain tire sizes and alternative rim size to the passenger car tire standard and the tire selection and rim standard.

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109 and to Appendix A, Standard No. 110. Under these guidelines, the addition becomes effective 30 days from date of publication in the *Federal Register*, if no objections to the proposed additions are received. If objections to the amendment are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR 553) are followed. All changes made to the appendices as of April 16, 1971 were reissued and incorporated into the tables and republished in the *Federal Register* of May 4, 1971 (36 F.R. 8298).

The European Tyre and Rim Technical Organisation has petitioned for the following:

(1) The addition of the new 205/70 R14, 215/70 R14, 225/70 R14, 195/70 R15, 205/70 R15, 215/70 R15, 225/70 R15, 150 R12, 150 R14 and 180 R15 tire size designations to Table I, Appendix A of Standard No. 109 and the appropriate test and alternative rims to Table I, Appendix A of Standard No. 110.

(2) The addition of the 5.50 B altenative rim for the 165 R13 tire size designation to Table I, Appendix A of Standard No. 110.

(3) The addition of the 16 psi and 18 psi loads to Table I-H, Appendix A of Standard No. 109.

The Rubber Manufacturers Association has petitioned for the addition of the 6–JJ alternative rim size for the DR 78–14 tire size designation to Table I, Appendix A of Standard No. 110.

On the basis of the data submitted by the European Tyre aand Rim Technical Organisation and the Rubber Manufacturers Association indicating compliance with the requirements of Federal Motor Vehicle Safety Standards No. 109 and 110 and other information submitted in accordance with the procedural guidelines, § 571.21 of Part 571 Federal Motor Vehicle Safety Standards, Appendix A of Standard No. 109 and Appendix A of Standard No. 110 are amended to read as set forth below, effective 30 days from date of publication in the *Federal Register.*

In addition, Appendix A of Standard No. 109 is amended in order to make it clear that requests for additional tire sizes should specify whether the tire is an addition to a category of tires listed in the tables, or a new category for which a table has not been developed.

Issued on July 13, 1971.

Robert L. Carter
Acting Associate Administrator
Motor Vehicle Programs

36 F.R. 13601
July 22, 1971

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–17; Notice No. 1)

This amendment adds certain tire sizes and alternative rim size to the passenger car tire standard and the tire selection and rim standard.

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109 and to Appendix A, Standard No. 110. Under these guidelines, the addition becomes effective 30 days from date of publication in the *Federal Register*, if no objections to the proposed additions are received. If objections to the amendment are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR 553) are followed. All changes made to the appendices as of April 16, 1971 were reissued and incorporated into the tables and republished in the *Federal Register* on May 4, 1971 (36 F.R. 8298).

The European Tyre and Rim Technical Organisation has petitioned for the addition of the 7–K alternative rim size for the 185/70 R15 tire size designation and the 6–JJ alternative rim size for the 205/70 R14 tire size designation to Table I, Appendix A of Standard No. 110.

The Rubber Manufacturers Association has petitioned for the addition of the 6½–JJ alternative rim size for the G78–15 tire size designation to Table I, Appendix A of Standard No. 110.

The Rubber Manufacturers Association has petitioned to change the test rim from 7½–inch to 7–inch for the J60–14, J60–15 and L60–15 tire size designations currently listed within the Table I-K, Appendix A of Standard No. 109.

Also, the Rubber Manufacturers Association has petitioned to correct the section width and minimum size factor measurements for the GR60–15 tire size designation listed within Table I-R, Appendix A of Standard No. 109.

On the basis of the data submitted by the European Tyre and Rim Technical Organisation and the Rubber Manufacturers Association indicating compliance with the requirements of Federal Motor Vehicle Safety Standards No. 109 and 110 and other information submitted in accordance with the procedural guidelines, § 571.21 of Part 571 Federal Motor Vehicle Safety Standards, Appendix A of Standard No. 109 and Appendix A of Standard No. 110 are amended as set forth below, effective 30 days from date of publication in the *Federal Register*.

Issued on July 22, 1971.

Robert L. Carter
Acting Associate Administrator
Motor Vehicle Programs

36 F.R. 14134
July 30, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 109

Pneumatic Tires—Passenger Cars

(Docket No. 71–20, Notice 1)

This amendment adds certain tire sizes and alternative rim sizes to the passenger car tire standard and tire selection rim standard.

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109 and to Appendix A, Standard No. 110. Under these guidelines, the addition becomes effective 30 days from date of publication in the *Federal Register*, if no objections to the proposed additions are received. If objections to the amendment are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR Part 553) are followed.

The Rubber Manufacturers Association has petitioned for the following:

(1) The addition of the new GR60–14 tire size designation to Table I, Appendix A of Standard No. 109 and the appropriate test and alternative rims to Table I, Appendix A of Standard No. 110.

(2) The addition of the following alternative rims to Table I, Appendix A of Standard No. 110:

(a) The 9–JJ alternative rim size for the G60–15 tire size designations.

(b) The 5–JJ and 6–JJ alternative rim sizes for the FR78–14 tire size designation.

(c) The 8–JJ alternative rim size for the F70–14 tire size designation.

(d) The 5–JJ alternative rim size for the D70–14 tire size designation.

(e) The 7–JJ alternative rim size for the GR70–15 tire size designation.

(f) The 6½–JJ alternative rim size for the 8.25–15 tire size designation.

The European Tyre and Rim Technical Organisation has petitioned for the following:

(1) The addition of the new 230–15, 245/60 R14 and 255/60 R15 tire size designations to Table I, Appendix A of Standard No. 109 and the appropriate test and alternative rims to Table I, Appendix A of Standard No. 110.

(2) The addition of the following alternative rims to Table I, Appendix A of Standard No. 110:

(a) The 9–L alternative rim size for the HR60–15 tire size designation.

(b) The 8K and 8½–L alternative rim sizes for the 225/70 R15 tire size designation.

(c) The 5½–JJ alternative rim size for the 155 R13 tire size designation.

On the basis of the data submitted by the European Tyre and Rim Technical Organisation and the Rubber Manufacturers Association indicating compliance with the requirements of Federal Motor Vehicle Safety Standards No. 109 and No. 110 and other information submitted in accordance with the procedural guidelines, § 571.21 of Part 571 Federal Motor Vehicle Safety Standards, Appendix A of Standard No. 109 and Appendix A of Standard 110 are amended to read as set forth below, effective 30 days from date of publication in the *Federal Register*.

Issued on October 21, 1971.

Robert L. Carter
Acting Associate Administrator
Motor Vehicle Programs

36 F.R. 21355
November 6, 1971

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 71–22; Notice No. 1)

This amendment adds certain tire sizes and alternative rim sizes to the passenger car tire standard and tire selection and rim standard.

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109 (§ 571.109) and to Appendix A, Standard No. 110 (§ 571.110). Under these guidelines, the addition becomes effective 30 days from date of publication in the *Federal Register*, if no objections to the proposed additions are received. If objections to the amendment are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR Part 553) is followed.

The Rubber Manufacturers Association has petitioned for the following:

(1) The addition of the new AR70–13. B60–13 and BR60–13 tire size designations to Table I, Appendix A of Standard No. 109 and the appropriate test and alternative rims to Table I, Appendix A of Standard No. 110.

(2) The addition of the following alternative rim sizes to Table I, Appendix A of Standard No. 110:

(a) The 6½–JJ alternative rim size for the F78–15 tire size designation.

(b) The 6½–JJ alternative rim size for the 7.75–15 tire size designation.

The European Tyre and Rim Technical Organisation has petitioned for the addition of the following alternative rim sizes to Table I, Appendix A of Standard No. 110:

(1) The 5–JJ alternative rim size for the 145R13 tire size designation.

(2) The 4–JJ alternative rim size for the 150R13 tire size designation.

(3) The 6½–JJ alternative rim size for the 185R14 tire size designation.

(4) The 6½–JJ alternative rim size for the 9.00–15 tire size designation.

The Ford Motor Company has petitioned for the addition of the 5½–JJ alternative rim size for the 6.45–13/165–13 tire size designation to Table I, Appendix A of Standard No. 110.

The Toyota Motor Company, Ltd., has petitioned for the addition of the 4–JJ alternative rim for the 155R13 tire size designation to Table 1, Appendix A of Standard No. 110.

On the basis of the data submitted by the European Tyre and Rim Technical Organisation, the Rubber Manufacturers Association, the Ford Motor Company and Toyota Motor Company, Ltd. indicating compliance with the requirements of Federal Motor Vehicle Safety Standards No. 109 and No. 110 and other information submitted in accordance with the procedural guidelines, § 571.109 and § 571.110 of Title 49, Code of Federal Regulations are amended, effective 30 days from date of publication in the *Federal Register.*

(Secs. 103 and 119, National Traffic and Motor Vehicle Safety Act of 1966, 15 U.S.C. 1392, 1407; delegations of authority at 49 CFR 1.51 and 501.8)

Issued on December 15, 1971.

Robert L. Carter
Acting Associate Administrator
Motor Vehicle Programs

36 F.R. 24940
December 24, 1971

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 72-18; Notice 1)

This amendment adds certain tire sizes and accompanying values, and amends values for existing tire size designations in Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109), and adds alternative rim sizes and test rims to Motor Vehicle Safety Standard No. 110 (49 CFR § 571.110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109, and to Appendix A, Standard No. 110. Under these guidelines the additions become effective 30 days from the date of publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR 553) is followed.

Beginning in January 1972, the NHTSA inaugurated a procedure whereby amendments to the tables of Appendix A of Standard No. 109 and Appendix A of Standard No. 110 would be published approximately 4 times per year: on or about January 1, April 1, July 1, and October 1. Amendments to the tables were not published April 1 or July 1, 1972, and this notice publishes the amendments that would normally have been published on those dates.

Accordingly, Appendix A of Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109), and Appendix A of Motor Vehicle Safety Standard No. 110 (49 CFR § 571.110), are amended, subject to the thirty-day provision indicated above, as specified below.

This notice is issued under the authority of sections 103, 119, 201, and 202 of the National Traffic and Motor Vehicle Safety Act (15 USC 1392, 1407, 1421, 1422) and the delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.

Issued on July 27, 1972.

Robert L. Carter
Associate Administrator for
Motor Vehicle Programs

37 F.R. 15430
August 2, 1972

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires, Tire Selection and Rims for Passenger Cars

(Docket No. 72–18; Notice 2)

The NHTSA published on August 2, 1972 (37 F.R. 15430), additions and amendments to the tables in the Appendices of Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) and Motor Vehicle Safety Standard No. 110 (49 CFR 571.110). Guidelines published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), provide that routine additions to the Tables become effective 30 days from the publication date if no objections are received. If objections are received, rulemaking pursuant to 49 CFR Part 553 is initiated.

The European Tyre and Rim Technical Association (E.T.A.T.O.) has raised an objection to changes made by the August 2 publication to load values in Table I–H of Standard No. 109. Accordingly, the amendment to Table I–H, Appendix A, Motor Vehicle Safety Standard No. 109 (571.109), published August 2, 1972 (item 3, page 15430), is hereby revoked. Notice of proposed rulemaking regarding these load values will be issued. The other amendments issued in the publication of August 2, 1972, will become effective if no further objections are received by September 1, 1972.

This notice is issued pursuant to sections 103, 119, 201, and 202 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407, 1421, and 1422) and the delegations of authority at 49 CFR 1.51, 49 CFR 501.8.

Issued on August 29, 1972.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

37 F.R. 17837
September 1, 1972

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires, Tire Selection and Rims for Passenger Cars

(Docket No. 72-21; Notice 1)

This amendment adds certain new tire size designations and accompanying values and amends values for existing tire size designations in Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109), and adds alternative rim sizes and test rims to Motor Vehicle Safety Standard No. 110 (49 CFR § 571.110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be added to Appendix A, Standard No. 109, and to Appendix A, Standard No. 110. Under these guidelines the additions become effective 30 days from the date of publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR Part 533) is followed. An amendment to the tables was published on August 2, 1972 (37 F.R. 15430). This notice adds tire size designations inadvertently omitted and corrects certain errors made in that publication. It also adds a new tire size designation on which a petition was received after August 2, 1972.

Accordingly, Appendix A of Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109), and Appendix A of Motor Vehicle Safety Standard No. 110 (49 CFR § 571.110), are amended . . .

Effective: October 15, 1972

(Sec. 103, 119, 201, 202, National Traffic and Motor Vehicle Safety Act. 15 U.S.C. 1392, 1407, 1421, 1422 delegations of authority at 49 CFR 1.51, 49 CFR 501.8)

Issued on September 8, 1972.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

37 F.R. 18733
September 15, 1972

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires, Tire Selection and Rims for Passenger Cars

(Docket No. 72–18; Notice 3)

The NHTSA published on August 2, 1972 (37 F.R. 15430), additions and amendments to the Tables in the Appendices of Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109) and Motor Vehicle Safety Standard No. 110 (49 CFR § 571.110). Guidelines published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), provide that routine additions to the Tables become effective 30 days from the publication date if no objections are received. If objections are received, rulemaking pursuant to 49 CFR Part 553 is initiated.

The Rubber Manufacturers' Association (R.M.A.) and the B.F. Goodrich Tire Company have raised an objection to the change made by the August 2 publication to Footnote 1, Table I–R of Standard No. 109, which would have allowed the letters "HR", "SR", or "VR" to be included in any tire size designation adjacent to or in place of the dash. Accordingly, the amendment to Footnote 1, Table I–R of Appendix A, Motor Vehicle Safety Standard No. 109 (571.109), published August 2, 1972 (Item 17, page 15432), is hereby revoked. Notice of proposed rulemaking regarding this change will be issued before the rule is amended.

This notice is issued pursuant to sections 103, 119, 201, and 202 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407, 1421, and 1422) and the delegations of authority at 49 CFR 1.51, 49 CFR 501.8.

Issued on September 14, 1972.

Elwood T. Driver
Acting Associate Administrator
Motor Vehicle Programs

37 F.R. 19138
September 19, 1972

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 72-25; Notice1)

This amendment adds certain tire size designations to Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) and adds alternative rim sizes and test rims to Motor Vehicle Safety Standard No. 110 (49 CFR 571.110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, Standard No. 109, and to Appendix A, Standard No. 110. Under these guidelines the additions become effective 30 days from the date of publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking pursuant to the procedures for motor vehicle safety standards (49 CFR Part 553) is followed.

Accordingly, Appendix A of Motor Vehicle Safety Standard No. 109 (49 CFR 571.109), and Appendix A of Motor Vehicle Safety Standard No. 110 (49 CFR 571.110), are amended, subject to the 30-day provision indicated above . . . .

This notice is issued pursuant to sections 103, 119, 201 and 202 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1392, 1407, 1421, 1422) and the delegation of authority of 49 CFR 1.51 and 40 CFR 501.8.

Issued on October 16, 1972.

Robert L. Carter
Associate Administrator

37 F.R. 22620
October 20, 1972

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 73-7; Notice 1)

This amendment adds certain tire size designations to Federal Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) and adds alternative rim sizes and test rims to Federal Motor Vehicle Safety Standard No. 110 (49 CFR 571.110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, Standard No. 109, and to Appendix A, Standard No. 110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of Federal Motor Vehicle Safety Standard No. 109 (49 CFR 571.109), and Appendix A of Federal Motor Vehicle Safety Standard No. 110 (49 CFR 571.110), are amended, subject to the 30 day provision indicated above, as specified below.

Effective date: April 30, 1973, if objections are not received.

(Sec. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421, and 1422; delegations of authority 49 CFR 1.51, 49 CFR 501.8)

Issued on March 26, 1973.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

38 F.R. 8514
April 3, 1973

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 73–18; Notice 1)

This amendment adds certain tire size designations to Federal Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) and adds alternative rim sizes and test rims to Federal Motor Vehicle Safety Standard No. 110 (49 CFR 571.110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, Standard No. 109, and to Appendix A, Standard No. 110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of Federal Motor Vehicle Safety Standard No. 109 (49 CFR 571.109), and Appendix A, of Federal Motor Vehicle Safety Standard No. 110 (49 CFR 571.110), are amended, subject to the 30 day provision indicated above. . . .

Effective date: August 2, 1973, if objections are not received.

(Secs. 103, 119, 201, and 202, Public Law 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421, and 1422; delegation of authority at 38 F.R. 12147)

Issued on June 26, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 17842
July 5, 1973

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 73-23; Notice 1)

This amendment adds certain tire size designations to 49 CFR § 571.109 (Federal Motor Vehicle Safety Standard No. 109) and adds alternative and test rim sizes to 49 CFR § 571.110 (Federal Motor Vehicle Safety Standard No. 110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, § 571.109, and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rule making procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above.

Effective date: November 9, 1973, if objections are not received.

(Sections 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421, and 1422; delegations of authority at 49 CFR § 1.51 and 49 CFR § 501.8.)

Issued on October 3, 1973.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

38 F.R. 28569
October 15, 1973

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 74–6; Notice 1)

This amendment adds certain tire size designations and corrects certain tire size criteria in 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109). It also adds alternative and test rim sizes to 49 CFR 571.110 (Federal Motor Vehicle Safety Standard No. 110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, § 571.109 and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above . . . .

Effective date: March 7, 1974, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563; 80 Stat. 718; 15 U.S.C. 1392, 1407, 1421, and 1422; delegations of authority at 49 CFR § 1.51 and 49 CFR § 501.8.)

Issued on January 30, 1974.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

39 F.R. 4664
February 6, 1974

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 74-17; Notice 1)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109) and adds alternative and test rim sizes to 49 CFR 571.110 (Federal Motor Vehicle Safety Standard No. 110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, § 571.109 and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above . . . .

Effective date: May 22, 1974, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421 and 1422; delegations of authority at 49 CFR § 1.51 and 49 CFR § 501.8.)

Issued on April 16, 1974.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

39 F.R. 14595
April 25, 1974

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 74–26; Notice 1)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109) and adds alternative and test rim sizes to 49 CFR 571.110 (Federal Motor Vehicle Safety Standard No. 110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions could be made to Appendix A, § 571.109 and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above . . . .

Effective date: August 19, 1974, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421 and 1422; delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.)

Issued on July 11, 1974.

Francis Armstrong
Acting Associate Administrator
Motor Vehicle Programs

39 F.R. 26404
July 19, 1974

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 74–38; Notice 1)

This amendment adds tire load ratings to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109) and adds alternative rim sizes to 49 CFR 571.110 (Federal Motor Vehicle Safety Standard No. 110).

On October 5, 1968, guidelines were published in the *Federal Register* (33 F.R. 14964) by which routine additions would be made to Appendix A, § 571.109 and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above . . . .

Effective date: November 21, 1974, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421 and 1422; delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.)

Issued on October 16, 1974.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs
39 F.R. 37489
October 22, 1974

PREAMBLE TO AMENDMENT TO APPENDIX A MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 75–1; Notice 1)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109) and adds alternative and test rim sizes to 49 CFR 571.110 (Federal Motor Vehicle Safety Standard No. 110).

Guidelines were published in the *Federal Register* October 5, 1968 (33 F.R. 14964), and amended August 13, 1974 (39 F.R. 28980), specifying procedures by which routine additions are made to Appendix A, § 571.109 and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR §571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above . . . .

Effective date: February 24, 1975, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat, 15 U.S.C. 1392, 1407, 1421 and 1422; delegations of authority at 49 CFR § 1.51 and 49 CFR § 501.8.)

Issued on January 17, 1975.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

40 F.R. 3597
January 23, 1975

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 75–1; Notice 2)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109) and adds alternative and test rim sizes to 49 CFR 571.110 (Federal Motor Vehicle Safety Standard No. 110).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), and amended August 13, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made to Appendix A, § 571.109 and to Appendix A, § 571.110. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 and Appendix A of 49 CFR § 571.110 are amended, subject to the 30-day provision indicated above. . . .

Effective date: August 2, 1975, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421 and 1422; delegation of authority at 49 CFR § 1.51 and 49 CFR § 501.8.)

Issued on June 26, 1975.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

40 F.R. 28457
July 7, 1975

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 75–1; Notice 3)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), and amended August 13, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made to Appendix A, § 571.109. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 is amended, subject to the 30-day provision indicated above. . . .

Effective date: December 15, 1975, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.51 and 49 CFR 501.8.)

Issued on November 6, 1975.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

40 F.R. 53033
November 14, 1975

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 75–1; Notice 2)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), and amended August 31, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made to Appendix A, § 571.109. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 is amended, subject to the 30-day provision indicated above. . . .

Effective date: February 23, 1976 if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.50 and 59 CFR 501.8.)

Issued on January 20, 1976.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

41 F.R. 3870
January 27, 1976

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 75–1; Notice 2)

This amendment adds a new tire size designation to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 FR 14964), and amended August 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made to Appendix A, § 571.109. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 is amended, subject to the 30-day provision indicated above. . . .

Effective date: May 22, 1976 if objections are not received.

(Sec. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on April 19, 1976.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

41 F.R. 16804
April 22, 1976

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 76–3; Notice 3)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 FR 14964), and amended August 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made to Appendix A, § 571.109. Under these guidelines the additions become effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 is amended, subject to the 30-day provision indicated above. . . .

Effective date: October 18, 1976 if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on September 10, 1976.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

41 F.R. 40473
September 20, 1976

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 76–3; Notice 4)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 FR 14964), and amended August 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 is amended, subject to the 30-day provision indicated above. . . .

Effective date: February 22, 1977, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on January 12, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 3844
January 21, 1977

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 77–02; Notice 1)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109).

Guidelines were published in the *Federal Register* on October 5, 1968 (33 CFR 14964), and amended August 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated above, as specified below.

Effective date: March 14, 1977, if objections are not received.

(Secs. 103, 119, 201 and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on February 4, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 9022
February 14, 1977

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 77–02; Notice 2)

This amendment adds certain tire size designations to 49 CFR 571.109 (Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*).

Effective date: July 11, 1977, if objections are not received.

For further information contact:

John Diehl
Office of Crash Avoidance
Motor Vehicle Programs
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590
(202–426–1715)

According to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the *Federal Register* on October 5, 1968 (33 FR 14964), and amended August 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

The principal authors of this document are John Diehl, Office of Crash Avoidance, and Roger Tilton, Office of Chief Counsel.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated above. . . .

(Secs. 103, 119, 201, and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on June 3, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 30620
June 16, 1977

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 77–02; Notice 3)

This amendment adds certain tire size designations to Standard No. 109, *New Pneumatic Tires—Passenger Cars.* This addition is made pursuant to a request from the European Tyre and Rim Technical Organisation to permit the production of tires with the specified designations.

Effective date: September 7, 1977, if objections are not received.

For further information contact:

John A. Diehl
Office of Crash Avoidance
Motor Vehicle Programs
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590
(202–426–1715)

Supplementary information: According to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), and amended August 31, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

The principal authors of this document are John A. Diehl, Office of Crash Avoidance, and Roger Tilton, Office of Chief Counsel.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated above. . . .

(Secs. 103, 119, 201, and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on August 1, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 39984
August 8, 1977

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 77–02; Notice 4)

This amendment adds certain tire size designations to Standard No. 109, *New Pneumatic Tires—Pasesnger Cars.* This addition is made pursuant to a request from the Rubber Manufacturers Association to permit the production of tires with the specified designations.

Effective date: September 7, 1977, if objections are not received.

For further information contact:

John A. Diehl
Office of Crash Avoidance
Motor Vehicle Programs
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D.C. 20590
(202–426–1715)

Supplementary Information: Accoring to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), and amended August 31, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed.

The principal authors of this document are John A. Diehl, Office of Crash Avoidance, and Roger Tilton, Office of Chief Counsel.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated above. . . .

(Secs. 103, 119, 201, and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8).

Issued on August 1, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 39983
August 8, 1977

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 77-02; Notice 5)

This amendment adds certain tire size designations to Standard No. 109, *New Pneumatic Tires—Passenger Cars.* This addition is made pursuant to a request from the Rubber Manufacturers Association (RMA) to permit the production of tires with the specified designation. Effective Date: November 25, 1977, if objections are not received.

For Further Information Contact:

John A. Diehl, Office of Crash Avoidance, Motor Vehicle Programs, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1715).

Supplementary Information: According to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the Federal Register on October 5, 1968 (33 FR 14964), and amended August 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the Federal Register, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed. The RMA petitioned for this addition to the tire tables to permit production of tires with the specified designation. Their request is granted.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated above, as specified below. . . .

The principal authors of this document are John A. Diehl, Office of Crash Avoidance, and Roger Tilton, Office of Chief Counsel.

(Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8)

Issued on October 17, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 56333
October 25, 1977

PREAMBLE TO APPENDIX A OF FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires for Passenger Cars

(Docket No. 77–02; Notice 5)

Action: Final rule.

Summary statement: This amendment adds certain tire size designations to Standard No. 109, New Pneumatic Tires—Passenger Cars. The addition is made pursuant to a request from the Japan Automobile Tire Manufacturers Association to permit the production of tires with the specified designations.

Effective date: January 11, 1978, if objections are not received.

For further information contact:

John A. Diehl, Office of Crash Avoidance, Motor Vehicle Programs, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, D.C. 20590, 202-426-1715.

Supplementary information: According to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the Federal Register on October 5, 1968 (33 FR 14964), and amended April 31, 1974 (39 FR 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the Federal Register, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed. The Japan Automobile Tire Manufacturers Association petitioned for this addition to the tire tables to permit the production of tires with the specified designations.

The principal authors of this document are John A. Diehl, Office of Crash Avoidance, and Roger Tilton, Office of Chief Counsel.

Accordingly, Appendix A of 49 CFR 571.109 is amended, subject to the 30-day provision indicated above. . . .

(Secs. 103, 119, 201, and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on December 7, 1977.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

42 F.R. 62386
December 12, 1977

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 78-03; Notice 1)

This amendment adds certain tire size designations to Standard No. 109, *New Pneumatic Tires—Passenger Cars*. This addition is made pursuant to a request from the Rubber Manufacturers Association (RMA) to permit the production of tires with the specified designations.

Effective Date: March 8, 1978 if objections are not received.

For further information contact:

John A. Diehl, Crash Avoidance Division,
Office of Vehicle Safety Standards, National
Highway Traffic Safety Administration, 400
Seventh Street, S.W., Washington, D.C.
20590 (202-426-1715).

Supplementary Information: According to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), an damended August 31, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 533) are followed. The RMA petitioned for thise addition to the tire tables to permit production of tires with the specified designations. This request is granted.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated. . . .

The principal authors of this document are John A. Diehl, Office of Vehicle Safety Standards, and Roger Tilton, Office of Chief Counsel.

(Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on January 27, 1978.

Elwood T. Driver
Acting Associate Administrator
for Rulemaking

43 F.R. 4859
February 6, 1978

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

(Docket No. 78-03; Notice 2)

This amendment adds certain tire size designations to Standard No. 109, *New Pneumatic Tires—Passenger Cars.* This addition is made pursuant to a request from the Michelin Tire Corporation to permit the production of tires with the specified designations.

Effective Date: March 8, 1978, if objections are not received:

For further information contact:

John A. Diehl, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1717).

Supplementary Information: According to agency practice, regular amendments are published modifying the Appendix of Standard No. 109. Guidelines were published in the *Federal Register* on October 5, 1968 (33 F.R. 14964), and amended August 31, 1974 (39 F.R. 28980), specifying procedures by which routine additions could be made effective 30 days from publication in the *Federal Register*, if no objections are received. If objections are received, rulemaking procedures for the issuance of motor vehicle safety standards (49 CFR Part 553) are followed. The Michelin Tire Corporation petitioned for this addition to the tire tables to permit production of tires with the specified designations. This request is granted.

The principal authors of this document are John A. Diehl, Crash Avoidance Division, and Robert M. Churella, Office of Chief Counsel.

Accordingly, Appendix A of 49 CFR § 571.109 is amended subject to the 30 day provision indicated. . . .

(Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on January 27, 1978.

Elwood T. Driver
Acting Associate Administrator
for Rulemaking

43 F.R. 4860
February 6, 1978

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 78–04, Notice 2; Docket No. 78–03, Notice 4)

This notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding four new metric tire size designations to Appendix A of the standard and by establishing criteria for testing and labeling higher inflation pressure tires. These amendments are made in response to petitions by the Goodyear Tire & Rubber Co. and the Rubber Manufacturers Association (RMA) in support of a Goodyear tire, and Michelin Tire Corp. The notice permits the introduction into interstate commerce of certain new metric-unit tires, one of which is a higher inflation tire enabling improved automobile fuel economy. The addition of the metric-unit tires accommodates the nation's conversion to the metric system, and the addition of the higher inflation tire also responds to the nation's need to conserve energy. This notice defers final action on proposals, issued in response to petitions by the RMA and Michelin Tire Corp., to amend the standard by adding two other new metric tire size designations to Appendix A.

Effective date: Date of publication of this notice in Federal Register, June 5, 1978.

For further information contact:

Arturo Casanova, Crash Avoidance Division,
Office of Vehicle Safety Standards, National
Highway Traffic Safety Administration, 400
Seventh Street, S.W., Washington, D.C.
20590, 202–426–1715.

Supplementary information: This notice establishes a final rule with respect to two separate rulemaking actions, one initiated pursuant to a petition by Michelin Tire Corp. (Michelin), and the other initiated pursuant to petitions by the Goodyear Tire & Rubber Co. (Goodyear) and the RMA.

In response to a petition by Michelin, (October 17, 1977), the NHTSA published a final rule (February 6, 1978; 43 FR 4859) amending Appendix A of Standard No. 109 by adding five new metric tire size designations under an abbreviated rulemaking procedure for expediting routine amendments to Appendix A tire tables. Guidelines for this procedure (October 5, 1968, 33 FR 14963; as amended May 4, 1971, 36 FR 8298; July 22, 1971, 36 FR 13601; and August 31, 1974, 39 FR 28980) provide that such additions may be made without being preceded by a notice of proposed rulemaking. However, if objections to a final rule are received within the 30 day comment period provided, the rule does not become effective. In this case regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated. Objections to the February 6, 1978, amendments were received. On April 3, 1978, the agency published a notice (43 FR 13903) proposing amendments of Standard No. 109 which would modify Appendix A by adding four new metric tire size designations and revise the table in Figure 1 of the standard by adding a new wheel size and its corresponding bead unseating test dimension. The proposed revisions of the table in Figure 1 are necessary to enable performance of the bead unseating test (section 4.2.2.3) on one of the proposed tire sizes.

In response to petitions from Goodyear (November 3, 1977) and the RMA (November 17, 1977) in support of a Goodyear tire, and from the RMA (January 17, 1978) in support of a Dunlop tire, the NHTSA published a notice (March 2, 1978; 43 FR 8570) proposing amendments of Standard No. 109 which would modify Appendix A of the standard by adding two new metric tire size designations and modify the standard to allow a higher maximum inflation pressure and establish criteria for performance testing of higher inflation pressure tires.

All comments received on these notices have been considered and the most significant are discussed below.

For the reasons set forth below this notice (1) adopts the amendments proposed in the Michelin notice with respect to the addition to Appendix A of the new tire size designations 195/60R390, 180/65R390, and 190/65R390, requested by Michelin, (2) adopts the amendments proposed in the Goodyear-RMA notice with respect to the addition to Appendix A of the new tire size designation P215/65R390 requested by Goodyear and RMA in support of a Goodyear tire, and the modifications of the standard necessary to enable testing that tire, and (3) defers final action on (a) the amendments proposed in the Michelin notice to add the 180/65R365 tire size designation to Appendix A and to revise the table in Figure 1 of the standard to enable conducting the bead unseating test on this tire size, requested by Michelin, and (b) the amendment proposed in the Goodyear-RMA notice to add the P195/65R370 tire size designation to Appendix A, requested by RMA in support of a Dunlop tire.

Goodyear, Dunlop, and Michelin Tires: Intermix. The nation's gradual conversion from the English system of measurement to the metric system is reflected in the current proposals to add metric tire size designations to Appendix A tire tables. Some similarity in size between existing English-unit tires and new metric-unit tires requested seems inevitable during the conversion. However, the problems posed by conversion, if any, should be temporary, i.e., limited to the transition phase.

Comments objecting to the addition of each of the new metric tire size designations proposed in the Michelin and Goodyear-RMA notices alleged that "intermix" or "mismatch" problems could accidentally occur when replacing a tire in the course of vehicle use. Some commenters asserted that, because the nominal diameters of the proposed metric tires and corresponding metric rims (365mm, 370mm, and 390mm) are very nearly the same as those of certain existing English-unit tire/rim diameters (14 inch, 15 inch, and 16 inch), it would be technically possible to mount an English-unit tire on a requested metric unit rim, or conversely to mount a metric-unit tire on an existing English-unit rim. Some commenters alleged that serious safety problems, such as tire explosion during, or road failures shortly after tire mounting could occur as a result of such intermixing. General Motors (GM) and the Armstrong Rubber Company (Armstrong) directed such allegations to all of the requested tires in both notices, and the Department of California Highway Patrols directed this objection to the Michelin requests. Other commenters predicted that tire/rim mismatches could occur among certain combinations of the new metric tire and rim sizes proposed for amendment of Standard No. 109, should all proposed amendments be adopted. However, none of the objections summarized above were supported by data demonstrating the safety hazards alleged, or even demonstrating that a tire could actually be mounted on an inappropriate rim and hold air.

GM requested that the NHTSA defer action on all the proposed new tire sizes for one year to allow the tire and vehicle industries to work out a general solution to potential intermix problems raised by these and other metric tires requested later. Dunlop requested that the NHTSA take no final action on the tires proposed in both notices without considering the potential safety hazards involved. The Department of California Highway Patrol recommended that the trend of proliferation of tire sizes be eliminated from the passenger car tire market in view of potential safety problems suggested. Mercedes-Benz asserted that the differences among the proposed tires were sufficient to prevent intermix, but that the anticipated introduction of additional tire-rim combinations raised the possibility of mismatch problems. Mercedes stated that the anticipated proliferation of metric tire sizes raised the prospect that the spare parts industry might not expand quickly enough to meet aftermarket needs, in view of the fact that a vehicle owner would need to replace his tires with the same type tire originally mounted. Mercedes suggested that the NHTSA encourage the development of uniform and interchangeable tires and rims. Armstrong objected to the Michelin and Goodyear proposals because of alleged confusion to the public and tire service personnel arising from the slight dimensional differences in metric and English tire/rim combinations.

Other persons submitted that no intermix problems were posed by the proposed tires. Chrysler Corporation stated that the P215/65R390 Goodyear tire raised no unique tire/rim intermix issues, but submitted no supporting data. Goodyear stated that its proposed metric tire and JM rim were designed with an objective of preventing misapplication with existing tires and rims. Goodyear submitted data on a series of automatic and hand tire-mounting trials conducted by the Tire and Rim Association (T&RA) on an earlier version of the 390 JM rim associated with this tire. The data, together with data submitted on the JM contour, demonstrated that the designated maximum well-depth of the 390 JM rim design precluded misapplication of 15 inch tires on it. Goodyear also submitted that while the Goodyear 390 mm tire (15.35 inches) can be mounted on a standard 15-inch rim, it will not hold air because flutes molded into the lower bead area of the tire bleed out air. No supporting data was provided. Ford submitted data on intermix tests conducted by Goodyear in conjunction with the T&RA on the precursor of the requested Goodyear tire and rim, and also data on tests conducted by Ford on the 390 mm tire requested by Goodyear and on the 390 mm TR rim requested by Michelin for use with its requested 390 mm tires. Test results were (1) that a 15 inch tire could not be mounted on the precursor to the JM rim or on the TR rim, and (2) that the Goodyear tire could be mounted on a 15 inch rim, but that the molded flutes or "blow-by" feature of the Goodyear tire bead prevented the formation of an air-tight seal. Based on test results, Ford supported approval of the 390 mm Goodyear and Michelin tires, but recommended that Standard No. 109 be amended to require this "blow-by" feature on metric tires to prevent misapplication with English-unit rims. Saab-Scania submitted that it had attempted to mount a 15 inch tire on the Michelin 390 mm TR rim and found it impossible; and that while its attempts to mount the 390 mm Michelin tire on a 15 inch JJ rim were successful, the tire could not be inflated.

The intermix concerns of several commenters would have been more appropriately raised in a petition for rulemaking that addressed any safety problems demonstrated as caused by intermixing inappropriate tires and rims. Alternatively, the concern could have been raised in a petition to commence an investigation to determine whether the size or configuration of the tires and rims constituted, in light of the alleged possibility of intermix and associated safety hazard, a safety related defect. On its own initiative, the agency is preparing to issue an advanced notice of proposed rulemaking on this subject. In view of its responsibility and broad authority under the Act to deal with safety problems, the agency believed that the allegation of intermix problems with respect to the current proposals to add new metric tires to Standard No. 109 warranted immediate inquiry. Accordingly, the agency initiated a program to test the intermix potential of these tires and associated rims with existing English-unit tires and rims, i.e., to test whether the proposed tires can be mounted on existing rims, or existing tires mounted on the proposed rims, and if so, whether safety hazards are found during mounting or on-road use.

In response to a request by the NHTSA, Goodyear submitted the 390 mm P215/65R390 tire and 390 mm JM rim, and Michelin submitted one of its 390 mm tires, the 190/65R390 tire and the 390 mm TR rim. Dunlop and Michelin stated they would not be able to submit the 370 mm P195/65R370 and the 365 mm 180/65R365 tires, respectively, until a later date.

The NHTSA tests conducted at the agency's Safety Research Laboratory in Riverdale, Maryland corroborated the test data submitted in support of the proposed 390 mm Goodyear and Michelin tires and rims, as summarized above. A standard 15 inch tire could not be intermixed with either the 390 mm JM or the 390 mm TR rim, because the well-depths established for these rims precluded mounting the tire. While the 390 mm Goodyear and Michelin tires submitted could be mounted on the existing 15 inch JJ contour rim, the special "flutes" incorporated on the bead seal area of each of these tires prevented the tire from holding air. Although comments alleged potential intermix problems relative to the requested 390 mm tires and rims and the 16 inch tire and 16 inch JJ rim, this allegation is academic since no 16 inch tires have ever been designed or produced for the 16 inch JJ rim. (Original equipment use of 16 inch passenger car tires included in Standard No. 109 tire tables was discontinued during the mid 1950s, and the JJ rim contour was not introduced until 1967.)

The Michelin 195/60R390 and 180/65R390 tires with their associated 390 mm JM or TR rims were not submitted for testing. However, the results of the tests performed on the Michelin and the Goodyear tires submitted and on their associated rims are conclusive with respect to the intermix potential of these two proposed Michelin tires and rims. This is because all four tires and associated rims are the same with respect to the variables found to be critical in preventing inappropriate intermixing of the tested tires and rims. The critical variables are: the nominal diameter of the tire and rim, or 390 mm for all four tires and associate rims; rim contour, e.g., TR or JM, which determines well-depth; and tire "flutes" molded into the tire bead. The nominal diameters of the tire and rim of the fourth Michelin tire requested, the 180/65R365 (365 mm), and of the requested Dunlop tire, the P195/65R370 (370 mm), are different from those tested. Another difference characterizing the Dunlop tire is the proposed DL rim contour. Therefore the NHTSA tests conducted to date are not conclusive as to whether either of these two tires and their associated rims can be intermixed with existing rims and tires, or intermixed one with the other, and if so, what any consequences of any such intermix might be.

The agency decided to proceed with final rulemaking action on all of the 390 mm tires proposed. The agency decided to defer final rulemaking on the 370 mm Dunlop tire and the 365 mm Michelin tire until agency intermix tests are performed on these tires.

The Michelin Tires: Information Submitted for Inclusion in Appendix A Tire Tables. The bases for accepting or denying requests to add new tire size designations to Table I of Appendix A of Standard No. 109 are set forth in introductory guidelines to the appendix (October 5, 1968, 33 FR 14964, as amended May 4, 1971, 36 FR 8298; July 22, 1971, 36 FR 13601; August 13, 1974, 39 FR 28980). In sum, the tests are appropriateness of the values submitted for inclusion in the tire tables, and appropriateness of the requested location within the tables of the requested tires.

As discussed in the April 3 Michelin notice, GM objected to the absence of a prefix "P" for 4 of the 5 new tire sizes requested by Michelin published in the February 6 Michelin notice. GM urged that this prefix be made mandatory to distinguish International Standards Organization (ISO) metric tire size designations from other metric tire size designations. The ISO standard for "Passenger car tyres and rims (Future series) Part 1: Tyres" states:

> This symbol ("P") may be used where there may be ambiguity regarding the tyre type. Where the optional marking is used, it should be so positioned that confusion cannot result from its proximity to any other service condition marking.

GM's comments noted that according to the practice of the T&RA, the prefix "P" is required to distinguish ISO metric size designations from other metric designations, even though the ISO standard makes use of the prefix optional. The NHTSA is of course not bound by the standards or practice of either organization. Neither the ISO nor the T&RA submitted comments discussing long-range effects of mandating the use of the prefix. Neither GM nor anyone else elaborated a rationale for preferring the T&RA practice to the ISO standard. Further, Michelin's response to the GM comment asserted that the tires requested in the April 3 Michelin notice have been and are currently marketed in Europe, where they are not designated by the prefix "P". In the absence of any rationale for mandating nomenclature to distinguish ISO metric tire designations from other metric tire sizes, in the absence of any data on or discussion of any ambiguity resulting from the nomenclature as proposed, and in the interest of maintaining consistency between European and U.S. nomenclature for the tire, the agency concludes that the absence of the prefix "P" is not inappropriate.

This conclusion is consistent with the fact that Table I–Y in Appendix A already lists a metric tire size designation which does not use the prefix "P". (195/60R350) Therefore, the agency accepts the tire size nomenclature requested by Michelin, as proposed.

Armstrong objected to the inclusion of the Michelin 195/60R390 and P205/60R390 tires as not being compatible with existing Standard No. 109 tire tables and as not having been approved by any technical standardizing body. Michelin subsequently withdrew its request to add the P205/60R390 tire to the standard. Under Appendix A guidelines, the test of compatibility is applicable to requests for addition of new tire sizes to existent tire tables. Where, as here, additional new tables for new tire construction are requested, the applicable test is "adequate justification" for the new tables. The NHTSA finds that there is adequate justification for the proposed new tables I–NN and I–PP precisely because the constructions of the new metric tires requested for inclusion in the new tables are distinguishable from those of tires in existing tables. Appendix A guidelines do not require approval of requested tire sizes by a recognized technical standardizing body, but only "A statement as to whether the tire size designation has been coordinated with" the organizations listed (guideline #4). Michelin submitted such a statement with respect to its requested metric tire size designations.

In the April 3 Michelin notice, the NHTSA requested comments on the alternative use of JM and TR rim profiles in conjunction with any of the requested Michelin metric tires, as proposed in that notice. JM is a metric rim profile established by the T&RA (October 7, 1977, "Design Guide of Tire and Rim Association"). TR is a metric rim profile established by the European Tyre and Rim Technical Organization (ETRTO) (1978 ETRTO Data Book, p. RP.11). Armstrong commented that the concurrent existence of the JM and TR rims on the market would entail potential safety-related consequences. Armstrong asserted that the "snap-in" valve used for the JM rim, with its 8.9mm (.350 inch) diameter valve hole specification, could accidentally be fitted into the TR valve hole, with its 10.0mm (.394 inch) diameter specification. The result would be loss of inflation pressure. Michelin has subsequently informed the NHTSA that it will petition the ETRTO to adopt a 8.9mm diameter valve hole dimension for the TR rim.

No commenter specifically addressed the issue of the alternative use of the JM and TR rim contours. NHTSA analysis of these contours indicates that, with the Michelin change to the 9mm valve hole dimension, the remaining differences between the two rims are insignificant in terms of their equivalent appropriateness for use in mounting any of the metric size tires requested by Michelin.

Armstrong raised a number of points alleged to safety-related weaknesses in the "snap-in" valve design of the JM rim. In comments on the February 6 Michelin notice, Armstrong had alleged that safety problems could also arise from the potential accidental installation of an English-unit valve in the TR valve hole, resulting in loss of inflation pressure. Such considerations of the potential consequences of the use of the rims requested in conjunction with the requested new tire size designations fall outside the permissible bases of agency denial of requests to amend Appendix A tire tables. The appropriate course of action is to submit a petition for rulemaking to establish or amend a standard to address the issues. Accordingly, the alternative use of the JM and TR rims in conjunction with the proposed Michelin tires is adopted, as proposed.

The Goodyear Tire: Fuel Economy, Vehicle Ride and Handling, and Labeling. The amendment of Standard No. 109 as proposed in the Goodyear-RMA notice would increase the maximum permissible inflation pressure permitted under the standard to 300 kPa (44 psi) and make conforming amendments throughout the standard to establish test criteria to enable conducting the standard's various performance tests on the proposed tire. The notice proposed that tire performance tests be established at the same load levels as prescribed for the 240 kPa (35 psi) tire, based on the agency's tentative conclusion that these load levels represent test conditions more severe than would result from utilization of a higher test inflation pressure, so that the safety of the tire is better assured. No comments were submitted addressing this point. Accordingly, the agency adopts these amendments as proposed.

The Goodyear new tire size designation P215/65R390 meets the criteria set forth in introductory guidelines to Appendix A for adding new tire sizes to Appendix A tire tables. Accordingly, the proposed amendment of Appendix A of Standard No. 109 adding this new tire size is adopted, as proposed.

Comments and data were submitted on the issue of the potential of the proposed higher inflation pressure tires to enable improved fuel economy in vehicle use compared to the potential of existing tires to enable improved vehicle fuel economy when tested under higher inflation pressures. All commenters agreed that the higher inflation pressure design of the requested Goodyear tire provides lowered rolling resistance, which enables improved fuel economy in vehicle use. Other comments and data were submitted in regard to ride quality and handling characteristics of vehicles using the proposed higher inflation pressure tires. All of these comments relate to issues which fall outside the ambit of Appendix A.

GM submitted that the addition of the Goodyear tire to Standard No. 109 necessitated an amendment of the labeling requirements of S4.3 of the standard to specify pressure at maximum load rating, in order to distinguish this pressure from maximum permissible inflation pressure where these two values do not correspond. Standard No. 109 requires labeling of maximum load rating and of maximum permissible inflation pressure. With respect to existing tires, values for maximum load rating and for maximum permissible inflation pressure always correspond. With respect to the Goodyear tire, there may be several inflation pressures for the maximum load rating. However, the maximum permissible inflation pressure for the Goodyear tire is always an appropriate inflation pressure for the maximum load rating. The labeling requirements do not purport to cover all possible inflation pressures and load ratings, but only the most extreme (i.e. "maximum") conditions under which it is safe to operate a tire. Since the information on these maximum conditions for inflation pressure and load ratings must be labeled on the Goodyear tire, it is unnecessary to amend the labeling requirements as requested.

In accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(c)) and Executive Order 12044, the NHTSA has reviewed the environmental and economic impacts of these amendments. There should be no negative environmental impacts. Further, since these are minor technical amendments of the standard which will permit the production of four new tire sizes, there should be no costs associated with their implementation. The agency has further concluded that this is not a significant regulation within the meaning of the Executive Order.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations, Part 571.109 (Standard No. 109, *New Pneumatic Tires-Passenger Cars*) is amended. . . .

The principal authors of this notice are Arturo Casanova of the Crash Avoidance Division, John Diehl of the Tire Performance Group, and Nancy Eager of the Office of Chief Counsel.

(Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on May 30, 1978.

Howard Dugoff
Acting Administrator

43 F.R. 24310-24314
June 5, 1978

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 78–03; Notice 5)

Pursuant to petitions by the European Tyre and Rim Technical Organisation (ETRTO) and by the Rubber Manufacturers Association (RMA), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding ten new tire size designations to Table I of Appendix A of the standard. The amendment permits the introduction into interstate commerce of the new tire sizes.

Effective date: 30 days from publication in the Federal Register, if objections are not received prior to that date.

Address: Comments should refer to the docket number and be submitted to Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

John Diehl, Office of Automotive Ratings,
National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20690, 202–426–1714.

Supplementary information: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure (October 5, 1968, 33 FR 14964, as amended May 4, 1971, 36 FR 8298; July 22, 1971, 36 FR 13601; and August 13, 1974, 39 FR 28980) provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by the agency during this 30-day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards (49 CFR Part 553) are to be initiated.

On March 20, 1978, the ETRTO petitioned for the addition of four new English-unit tire size designations to existing tables within Table I of Appendix A of Standard No. 109. On (April 11, 1978, April 25, 1978, May 25, 1978, and June 16, 1978) the RMA petitioned for the addition of six new English-unit tire size designations to existing tables within Table I of Appendix A of Standard No. 109. The bases for accepting or denying requests to add new tire size designations are set forth in introductory guidelines to the appendix (October 5, 1968, 33 FR 14964, as amended May 4, 1971, 36 FR 8298; July 22, 1971, 36 FR 13601; and August 13, 1974, 39 FR 28980). In sum, the tests are appropriateness of the information submitted for inclusion in the tire tables, and appropriateness of the requested location within the tables of the requested tire sizes. The ten new tire size designations requested to be added to Standard No. 109 meet these criteria. Accordingly, the ETRTO and the RMA petitions are granted, and the ten new tire size designations are added to Table I of Appendix A of the standard pursuant to the abbreviated rulemaking procedure.

In accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(c)) and Executive Order 12044, the NHTSA has reviewed the environmental and economic impacts of these amendments. There should be no negative environmental impacts. Further, since these are minor technical amendments of the standard which will permit the production of four new tire sizes, there should be no costs associated with their implementation. The agency has further concluded that this is not a significant regulation within the meaning of the Executive Order.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations (Part 571.109 (Standard No. 109, *New Pneumatic Tires—Passenger Cars*)) is amended....

All comments submitted must be limited to 15 pages in length. Necessary attachments may be appended to these submissions without regard to the 15-page limit. This limitation is intended to encourage commenters to detail their primary arguments in a succinct and concise fashion. It is requested but not required that 10 copies of comments be submitted.

If a commenter wishes to submit certain information under a claim of confidentiality, three copies of the complete submission, including purportedly confidential information, should be submitted to the Chief Counsel, NHTSA, at the address given above, and seven copies from which the purportedly confidential information has been deleted should be submitted to the Docket Section. Any claim of confidentiality must be supported by a statement demonstrating that the information falls within 5 U.S.C. Section 552(b)(4), and that disclosure of the information is likely to result in substantial competitive damage; specifying the period during which the information must be withheld to avoid that damage; and showing that earlier disclosure would result in that damage. In addition, the commenter or, in the case of a corporation, a responsible corporate official authorized to speak for the corporation must certify in writing that each item for which confidential treatment is requested is in fact confidential within the meaning of section 552(b)(4) and that a diligent search has been conducted by the commenter or its employees to assure that none of the specified items has previously been released to the public.

The principal authors of this notice are John Diehl of the Tire Performance Group and Nancy Eager of the Office of Chief Counsel.

(Sec. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on September 25, 1978.

Michael M. Finkelstein
Acting Associate Administrator
for Rulemaking

43 F.R. 45366
October 2, 1978

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 78–17; Notice 1)

Pursuant to petitions by the Michelin Tire Corporation (Michelin) and by the Rubber Manufacturers Association (RMA), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding four new tire size designations to Table I of Appendix A of the standard. The amendment permits the introduction into interstate commerce of the new tire sizes.

Effective date: 30 days from publication in the Federal Register, if objections are not received prior to that date.

Address: Comments should refer to the docket number and be submitted to Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

John Diehl, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1714).

Supplementary information: According to agency practice, the National Highway Traffic safety Administration responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments.

On July 13, 1978, Michelin petitioned for the addition of two new tire size designations requested to be located in a new table, I–QQ within Appendix A of Standard No. 109. On July 18, 1978, and August 3, 1978, the RMA petitioned for the addition of two new tire size designations to existing tables within Table I of Appendix A of the standard. The bases for accepting or denying requests to add new tire size designations are set forth in introductory guidelines to the appendix (October 5, 1968, 33 FR 14964, as amended May 4, 1971, 36 FR 8298; July 22, 1971, 36 FR 13601; and August 13, 1974, 39 FR 28980). The four new tire size designations requested to be added to Standard No. 109 meet these criteria. Accordingly, the Michelin and the RMA petitions are granted, and these new tire size designations are added to Table I of Appendix A of the standard pursuant to the abbreviated rulemaking procedure.

In accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)(c) and Executive Order 12044, the NHTSA has reviewed the environmental and economic impacts of these amendments. There should be no negative environmental impacts. Further, since these are minor technical amendments of the standard which will permit the production of four new tire sizes, there should be no costs associated with their implementation. The agency has further concluded that this is not a significant regulation within the meaning of the Executive Order.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations (Part 571.109 (Standard No. 109, *New Pneumatic Tires—Passenger Cars*)) is amended. . . .

All comments must be limited not to exceed 15 pages in length. Necessary attachments may be appended to these submissions without regard to the 15-page limit. This limitation is intended to encourage commenters to detail their primary arguments in a succinct and concise fashion. It is requested but not required that 10 copies of comments be submitted.

If a commenter wishes to submit certain information under a claim of confidentiality, three copies of the complete submission, including purportedly confidential information, should be submitted to the Chief Counsel, NHTSA, at the address given above, and seven copies from which the purportedly confidential information has been deleted should be submitted to the Docket Section. Any claim of confidentiality must be supported by a statement demonstrating that the information falls within 5 U.S.C. section 552(b)(4), and that disclosure of the information is likely to result in substantial competitive damage; specifying the period during which the information must be withheld to avoid that damage; and showing that earlier disclosure would result in that damage. In addition, the commenter or, in the case of a corporation, a responsible corporate official authorized to speak for the corporation must certify in writing that each item for which confidential treatment is requested is in fact confidential within the meaning of section 552(b)(4) and that a diligent search has been conducted by the commenter or its employees to assure that none of the specified items has previously been released to the public.

All comments received before the close of business on the comment closing date indicated above will be considered, and will be available for examination in the docket at the above address both before and after that date.

The principal authors of this notice are John Diehl of the Office of Vehicle Safety Standards and Nancy Eager of the Office of Chief Counsel.

(Sec. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on November 27, 1978.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

43 F.R. 56668-56671
December 4, 1978

PREAMBLE TO AMENDMENT TO APPENDIX A OF FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires for Passenger Cars

(Docket No. 79–01; Notice 1)

Action: Final rule.

Summary: Pursuant to petitions by the Rubber Manufacturers Association (RMA), European Tyre and Rim Technical Organisation (ETRTO), and Michelin Tire Corporation (Michelin), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding certain tire size designations to Appendix A of the standard. This amendment permits the introduction into interstate commerce of the new tire sizes.

Effective date: 30 days from the date of publication in the Federal Register, if objections are not received before that date.

Address: Comments should refer to Docket 79–01 and be submitted to Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

John Diehl, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1714).

Supplementary information: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 FR 14964, October 5, 1968 and amended at 36 FR 8298, May 4, 1971; 36 FR 13601, July 22, 1971; and 39 FR 28980, August 13, 1974. These guidelines provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by the agency during this 30 day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

ETRTO petitioned for the addition of a new tire size to an existing table within Table I of Appendix A of Standard No. 109 on September 28, 1977. On October 24, 1978, Michelin petitioned for the addition of a new P-metric series tire size to an existing table within Table I of Appendix A of Standard No. 109. On November 1, 1978, and December 1, 1978, RMA filed petitions requesting the addition of five new P-metric tire sizes to the existing tables. The basis for accepting or denying requests to add new tire size designations is set forth in introductory guidelines to the appendix. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables, and appropriateness of the requested location within the tables of the requested tire sizes. The seven new tire size designations requested to be added to Standard No. 109 appear to meet these criteria. Accordingly, the Michelin, ETRTO, and RMA petitions are granted, and the seven new tire size designations are added to Table I of Appendix A of the standard pursuant to the abbreviated rulemaking procedure.

In consideration of the foregoing, 49 CFR § 571.109 is amended . . . subject to the 30 day comment period outlined above.

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended to these submissions without regard to the 15 page limit. This limitation is intended to encourage commenters to detail their primary arguments in a succinct and concise fashion.

The agency has reviewed the impacts of this proposal and determined that they are minimal and that this is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this notice are John Diehl and Stephen Kratzke, respectively.

AUTHORITY: Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.

Issued on February 21, 1979.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

44 F.R. 11549
March 1, 1979

PREAMBLE TO AMENDMENT TO APPENDIX A OF FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 77–02; Notice 7)

Action: Final rule.

Summary: This notice grants in part and denies in part a petition submitted by the Japan Automobile Tire Manufacturers Association requesting the addition of two new tire size designations to Appendix A of Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars.* The requested sizes have been redesignated using the alpha numeric system, because if the metric system were used, the values given for these tires would differ from those agreed upon by the International Organization for Standardization. When the alpha numeric system of designating tire sizes is used, one of the requested tire sizes duplicates a size currently included in the Appendix. Inclusion of that size again is unnecessary and therefore the request is denied. The request for inclusion of the other tire size is granted. Promulgation of this final rule permits the introduction of that size into interstate commerce.

Effective date: May 10, 1979.

For further information contact:

John Diehl, Office of Automotive Ratings, Crash Avoidance Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1714).

Supplementary information: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) respond to petitions for adding new tire sizes to Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure (33 FR 14964, October 5, 1968, as amended at 39 FR 28980, August 13, 1974) provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by NHTSA during this 30-day period. If objections are received, rulemaking procedures for proposing and issuing motor vehicle safety standards (49 CFR Part 553) are to be initiated.

Pursuant to a petition from the Japan Automobile Manufacturers Association (July 26, 1977), a final rule amending Appendix A by adding two new tire size designations was published at 42 FR 62386, December 12, 1977, using the abbreviated rulemaking procedure. An objection to this amendment was timely submitted by General Motors Corp. (GM) on January 11, 1978. Accordingly, the amendment did not become effective.

NHTSA published a notice of proposed rulemaking on this addition at 43 FR 22420, May 25, 1978. In response to that notice, comments on the proposed tire sizes were submitted by GM and the B.F. Goodrich Company (Goodrich).

The petition had requested that two tire sizes, 225/60R13 and 225/60R14, be added to the appendix. GM and Goodrich both commented that the proposed millimetric 225/60R14 size designation was already included in Table I–R, under the alpha numeric designation of DR 60–14. A millimetric size designation describes the tire's cross-section width in millimeters, while the alpha numeric system describes the tire's cross-section width in inches. All the tire loads and other values for the requested 225/60R14 tire size were identical with those already listed for the DR 60–14 size. The commenters suggested that it would be most appropriate for NHTSA to add the values for the requested 225/60R13 size, but designate this size as DR 60–13, and deny the request with respect to the 225/60R14 size, since that size already appears in the tables.

There were two reasons offered in the comments for redesignating the requested tire sizes from 225/60R13 and 225/60R14 to DR 60–13 and DR 60–14. First, according to the commenters, the test rim widths and section widths requested by the petitioner for those tire sizes did not agree with the test rim widths and section widths agreed upon for those size tires by the International Organization for Standardization. Second, the commenters stated that consistency with international standardization efforts required the load values for the requested sizes to be expressed in kilograms and kilo Pascals, rather than in pounds and pounds per square inch, as proposed. There would be no inconsistency with the international standardization efforts for tire size designations if the tire sizes were redesignated as shown above.

NHTSA concurs with the suggestion that the international standardization of tire size designations is a desirable goal. When this can be promoted without any unduly great burden to the manufacturers or the public, NHTSA will generally follow this course. With respect to this petition, a redesignation of the tire sizes does not impose any significant burden on the manufacturers. The redesignation allows the tires to be sold without any further computation of values or testing by the manufacturer. Therefore, the benefits to be gained from harmonization of tire size designations outweighs the minimal burden imposed on the manufacturer by having to redesignate these tire sizes.

With this redesignation, the requested new tire sizes 225/60R13 and 225/60R14 become DR 60–13 and DR 60–14. The request for the DR 60–13 size is granted with the values proposed in the notice of proposed rulemaking for the 225/60R13 size. The request for the DR 60–14 size is denied, because that size is already included in Table I–R of the Appendix to Standard No. 109.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations, Part 571.109 is amended. . . .

NHTSA has reviewed this rule and determined that it is not a significant regulation within the meaning of Executive Order 12044. Further this action does not require an environmental impact statement under the National Environmental Policy Act (49 U.S.C. 4321 *et seq.*).

The program official and attorney principally responsible for the development of this rule are John Diehl and Stephen Kratzke, respectively.

AUTHORITY: Secs. 103, 109, 201, and 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegation of authority at 49 CFR 1.50.

Issued on May 1, 1979.

Joan Claybrook
Administrator

44 F.R. 27395
May 10, 1979

PREAMBLE TO AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 78–03; Notice 6; Docket No. 78–04; Notice 3)

Action: Final rule.

Summary: This notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding two new metric tire size designations to Appendix A of that Standard. These amendments are made in response to petitions by Michelin Tire Corporation and the Rubber Manufacturers Association (RMA). Issuance of this notice permits the introduction of these metric tire sizes into interstate commerce.

Effective date: May 10, 1979.

For further information contact:

Arturo Casanova, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-1715).

Supplementary information: This notice establishes a final rule with respect to two separate rulemaking actions, one initiated pursuant to a petition by RMA and the other initiated pursuant to a petition by Michelin Tire Corporation (Michelin). In response to a petition by RMA (January 17, 1978) supporting a Dunlop tire which would use a higher inflation pressure and is designed to be retained on the tire rim in the event of rapid tire deflation, the National Highway Traffic Safety Administration (NHTSA) published a notice of proposed rulemaking at 43 FR 8570, March 2, 1978. That notice also proposed the addition of a Goodyear tire designed to use a higher inflation pressure. Several comments objecting to the inclusion of these tires in Table I of Appendix A of Standard No. 109 were received by NHTSA.

In response to a petition by Michelin (October 3, 1977) requesting the addition of new metric tire size designations, NHTSA published a routine amendment to Table I at 43 FR 4860, February 6, 1978. Under the procedures established by NHTSA for routine tire table amendments (33 FR 14964, October 5, 1968, as amended by 39 FR 28980, August 31, 1974), new size designations are published as a final rule which becomes effective 30 days after publication in the Federal Register, unless objections are received before the expiration of that 30-day period. Objections were received, so the sizes were not added. Subsequently, NHTSA published a notice of proposed rulemaking to include these sizes in Table I of Appendix A of Standard No. 109; 43 FR 13903, April 3, 1978.

NHTSA resolved the issues raised by the comments on the inclusion of the Goodyear tire and all but one of the Michelin tire sizes, and published a final rule for these tire sizes at 43 FR 24310, June 5, 1978. In that rule, NHTSA indicated that it would publish separately a final rule dealing with the Dunlop and remaining Michelin tire sizes. This notice sets forth a final rule for those sizes.

Comments objecting to the addition of these two tire size designations alleged that "intermix" or "mismatch" problems could accidentally occur when replacing a tire on a vehicle. Some of the commenters asserted that, because the nominal diameters of the proposed metric tires and corresponding metric rims (365mm and 370mm) are very nearly the same as those of certain existing English-unit tire/rim diameters (14 inch and 15 inch), it would be technically possible to mount an English-unit tire on the requested metric unit rim, or conversely, to mount a metric unit tire on an existing English-unit rim. Some commenters alleged that serious safety problems, such as tire explosions during, or road failures shortly after tire mounting could occur as a result of such intermixing. General Motors (GM) and the Armstrong Rubber Company (Armstrong) directed such allegations to both tires in this notice and the Department of California Highway Patrols directed its objection to the Michelin request. However, none of the objections summarized above were supported by data demonstrating that the safety hazards alleged had occurred or even that they could occur.

GM requested that the NHTSA defer action on all the proposed new tire sizes for one year to allow the tire and vehicle industries to work out a general solution to potential intermix problems raised by these and other metric tires. Dunlop requested that NHTSA take no final action on the tires proposed without considering the potential safety hazards involved. The Department of California Highway Patrol recommended that the trend toward proliferation of passenger car tire sizes be halted in view of the potential safety problems discussed above. Mercedes-Benz asserted that the differences among the proposed tires were sufficient to prevent intermix, but that the anticipated introduction of additional tire-rim combinations raised the possibility of mismatch problems. Mercedes stated that the anticipated proliferation of metric tire sizes raised the prospect that the spare parts industry might not expand quickly enough to meet aftermarket needs, in view of the fact that a vehicle owner would need to replace the tires on the vehicles with the same type of tires originally mounted thereon. Mercedes suggested that NHTSA encourage the development of uniform and interchangeable tires and rims. Armstrong objected to the Michelin proposal because of alleged confusion of the public and tire service personnel arising from the slight dimensional differences in metric and English unit tire/rim combinations.

With respect to this larger issue of general standardization of tires sizes, NHTSA believes it is not necessary to resolve it before permitting these tire sizes to be introduced. As explained below, the intermix problem has been alleviated with respect to these particular tire sizes. Since this is the case, it is inappropriate to delay the introduction of these sizes while awaiting a resolution of the larger issue.

In the June 5, 1978, notice establishing a final rule for the Goodyear tire and the 390mm Michelin tires, the agency indicated that it would defer final rulemaking on the Michelin 365mm tire and the Dunlop 370mm tire until agency intermix tests were performed on these tires. NHTSA subsequently conducted its own intermix tests at this agency's Safety Research Laboratory in Riverdale, Maryland. These tests indicated that these two tire sizes would not present the alleged intermix problems. Both Dunlop and Michelin have incorporated a design feature, called "blow-by", in the bead seat area which will not allow intermixing. "Blow-by" consists of flutes molded onto the lower bead area of the tire which bleed out air in the event the tire is not mounted on the proper rim. Hence, if one of these tires were mounted on an English-unit rim, the tires would not be able to hold air. In addition, the Michelin 365mm tire and rim concept cannot be intermixed with Dunlop 370mm tire and rim concept and vice versa. Since this feature precludes any intermix problems, and no commenter raised any other issues regarding these tire sizes, NHTSA is proceeding with final rulemaking action on these proposed tire sizes.

In consideration of the foregoing, 49 CFR § 571.109 is amended. . . .

The agency has reviewed the impacts of this rule and determined that they are minimal and that this is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this rule are Arturo Casanova and Stephen Kratzke, respectively.

AUTHORITY: Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegation of authority at 49 CFR 1.51.

Issued on May 2, 1979.

Joan Claybrook
Administrator

44 F.R. 27394
May 10, 1979

PREAMBLE TO AMENDMENT TO APPENDIX A OF FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars

(Docket No. 79–01; Notice 2)

Action: Final rule.

Summary: Pursuant to petitions by the Rubber Manufacturers Association (RMA), European Tyre and Rim Technical Organisation (ETRTO), and Michelin Tire Corporation (Michelin), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding certain tire size designations to Appendix A of that standard. This amendment permits the introduction into interstate commerce of the new tire sizes.

Effective date: 30 days from the date of publication in the Federal Register, if objections are not received before that date. June 9, 1979. ADDRESS: Comments should refer to Docket 79-01 and be submitted to Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

John Diehl, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1714).

Supplementary information: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) respons to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 FR 14964, October 5, 1968, and amended at 36 FR 8298, May 4, 1971; 36 FR 13601, July 22, 1971; and 39 FR 28980, August 13, 1974. These guidelines provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by the agency during this 30 day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

On December 19, 1978, RMA petitioned for the addition of three new tires sizes to an existing table within Table I of Appendix A of Standard No. 109. RMA petitioned for the addition of seven new tire sizes to an existing table on January 23, 1979. RMA also petitioned on January 24, January 26, January 29, and February 1, 1979, for the addition of four other tire sizes to Table I. ETRTO petitioned on November 3, 1978, for the addition of a new table to Table I, and for three new tire sizes to be included in that table. ETRTO also petitioned on February 21, 1979 for the addition of five new tire sizes to existing tables in Table I. Michelin petitioned on January 19, 1979, for the addition of a new tire size to an existing table. The bases for accepting or denying requests to add new tire size designations are set forth in the introductory guidelines to Appendix A. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables, and the appropriateness of the requested location within the tables of the requested tire sizes. The 24 new tire size designations requested to be added to Standard No. 109 appear to meet these criteria. Accordingly, the Michelin, ETRTO, and RMA petitions are granted, and 23 new tire sizes designations are added to Table I of Appendix A of the standard pursuant to the abbreviated rulemaking procedure.

In consideration of the foregoing, 49 CFR § 571.109 is amended . . . subject to the 30-day comment period outlined above.

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended to these submissions without regard to the 15-page limit, This limitation is intended to encourage commenters to detail their primary arguments in a succinct and concise fashion.

The agency has reviewed the impacts of this rule and determined that they are minimal and that this is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this rule are John Diehl and Stephen Kratzke, respectively.

AUTHORITY: Secs. 103, 119, 201, and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421, and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.

Issued on May 2, 1979.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

44 F.R. 27396
May 10, 1979

PREAMBLE TO APPENDIX A OF FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires for Passenger Cars

(Docket No. 79–01; Notice 3)

Action: Final rule.

Summary: Pursuant to petitions by the Rubber Manufacturers Association (RMA), and Dunlop Tire and Rubber Corporation (Dunlop), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding certain tire size designations to Appendix A of that standard. This amendment permits the introduction into interstate commerce of the new tire sizes.

Effective Date: October 4, 1979 if objections are not received before that date.

Address: Comments should refer to Docket No. 79–01 and be submitted to Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C.

For Further Information Contact:

John Diehl, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1714).

Supplementary Information: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 FR 14964, October 5, 1968, and amended at 36 FR 8298, May 4, 1971; 36 FR 13601, July 22, 1971; and 39 FR 28980, August 13, 1974. These guidelines provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by NHTSA during this 30 day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

On March 22, 1979, RMA petitioned for the addition of a new tire size to an existing table within Table I of Appendix A of Standard No. 109. RMA also petitioned on March 28, June 4, June 19, and June 28, 1979, for the addition of five other tire sizes to existing tables in Table I. Dunlop petitioned on April 6, 1979, for the addition of a new table to Table I, and for a new tire size to be included in that table. The bases for accepting or denying requests to add new tire size designations are set forth in the introductory guidelines to Appendix A. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables, and the appropriateness of the requested location within the tables of the requested tire sizes. The seven new tir size designations requested to be added to Standard No. 109 appear to meet these criteria. Accordingly, the Dunlop and RMA, petitions are granted, and seven new tire sizes are added to Table I of Appendix A of the standard pursuant to the abbreviated rulemaking procedure.

In consideration of the foregoing, 49 CFR § 571.109 is amended as specified below, subject to the 30-day comment period outlined above....

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended without regard to the 15 page limit. This limitation is intended to encourage commenters to detail their primary arguments in a succinct and concise fashion.

The agency has reviewed the impacts of this rule and determined that they are minimal and that this is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this rule are John Diehl and Stephen Kratzke, respectively.

AUTHORITY: Secs. 103, 119, 201 and 202, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407, 1421 and 1422); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.

Issued on August 28, 1979.

A. C. Malliaris
Acting Associate Administrator
for Rulemaking

44 F.R. 51603
September 4, 1979

PREAMBLE TO AMENDMENT TO APPENDIX A OF MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires for Passenger Cars

(Docket No. 79-01; Notice 4)

ACTION: Final rule.

SUMMARY: Pursuant to petitions by the Rubber Manufacturers Association (RMA) and the European Tyre and Rim Technical Organisation (ETRTO), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars,* by adding certain tire size designations to Appendix A of that standard. This amendment permits the introduction into interstate commerce of the new tire sizes.

EFFECTIVE DATE: 30 days from date of publication in the Federal Register, if objections are not received before that date. January 16, 1980.

ADDRESSES: Comments should refer to Docket No. 79-01 and be submitted to Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours 8 a.m. to 4 p.m.)

FOR FURTHER INFORMATION CONTACT:

John Diehl, Office of Automotive Ratings, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202) 426-1714.

SUPPLEMENTARY INFORMATION: According to agency practice, the National Highway Traffic Safety Administration (NHTSA) responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 FR 14964; October 5, 1968, and amended at 36 FR 8298; May 4, 1971; 36 FR 13601; July 22, 1971; and 39 FR 28980; August 13, 1974. These guidelines provide that these final rules become effective 30 days after their date of publication if no comments objecting to them are received by NHTSA during this 30 day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

On July 9, 1979, RMA petitioned for the addition of a new tire size to an existing table with Table I of Appendix A of Standard No. 109. RMA also petitioned on September 14, September 18, and September 20 for the addition of three other tire sizes to existing tables in Table I. ETRTO petitioned for the addition of two new tire sizes to existing tables on July 16, 1979. The bases for accepting or denying requests to add new tire size designations are set forth in the introductory guidelines to Appendix A. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables, and the appropriateness of the requested location within the tables of the requested tire sizes. The six new tire size designations requested to be added to Standard No. 109 appear to meet these criteria. Accordingly, the RMA and ETRTO petitions are granted, and six new tire sizes are added to Table I of Appendix A of the Standard pursuant to the abbreviated rulemaking procedure.

In consideration of the foregoing, 49 CFR § 571.109 is amended by the addition of new tire size designations and corresponding values to Tables I-R, I-S, I-KK, I-LL, and I-WW.

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended without regard to the 15 page limit. This limitation is intended to encourage commenters to detail their primary comments in a concise fashion. Those persons desiring to be notified upon receipt of their comments in the rules docket should enclose a self-addressed, stamped postcard in the envelope with their comments. Upon receiving the comments, the docket supervisor will return the postcard by mail.

The agency has reviewed the impacts of this rule, and determined that permitting the introduction of these tire sizes will benefit those manufacturers desiring to produce the sizes and will have no effect on those manufacturers who do not. The public will be minimally affected by this rule. Accordingly, NHTSA has determined that this is not a significant regulation within the meaning of Executive Order 12044.

The program official and attorney principally responsible for the development of this rule are John Diehl and Stephen Kratzke, respectively.

Issued on December 7, 1979.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

44 F.R. 73102
December 17, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109A

Federal Motor Vehicle Safety Standards; New Pneumatic Tires for Passenger Cars

(Docket No. 80-14; Notice 3)

ACTION: Final rule.

SUMMARY: This rule deletes Table I from Appendix A of Federal Motor Vehicle Safety Standard 109. That table required that, before introducing and selling a new tire size, a manufacturer had to submit load and dimensional information to this agency and await the inclusion of the tire size in Table I. The agency has determined that this procedure was an unnecessary burden on the tire manufacturers for several reasons. First, submission to the agency of the load and dimensional data, which is needed for conducting compliance tests, was unnecessary since the data could be obtained simply from a tire standardization organization. Second, the agency did not attempt to validate independently the submitted data. Instead, NHTSA simply checked the submitted data against that published for the tire size in one of the standardization organization yearbooks. Under the new procedure published today, a manufacturer may introduce new tire sizes as soon as the load and dimensional information for the new size has been either submitted to this agency and to that manufacturer's dealers or published as a part of one of the standardization organization's yearbooks.

EFFECTIVE DATE: This amendment becomes effective 180 days after publication in the *Federal Register.*

ADDRESS: Petitions for reconsideration may be submitted within 30 days of the publication of this notice in the *Federal Register* to: Administrator, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

SUPPLEMENTARY INFORMATION: Standard No. 109, *New Pneumatic Tires—Passenger Cars,* 49 CFR § 571.109, specifies the requirements for all tires manufactured for use on passenger cars manufactured after 1948. This standard, which was issued under the National Traffic and Motor Vehicle Safety Act (Safety Act), requires that the tires meet specified strength, resistance to bead unseating, endurance, and high speed requirements, and be labeled with certain safety information. Closely related to this standard is Standard 110, *Tire Selection and Rims—Passenger Cars,* 49 CFR § 571.110, which requires that each passenger car be equipped with tires that comply with Standard 109, that tires on all cars be capable of carrying the load of that vehicle, that the rims on the car be appropriate for use with the tires, and that certain data about the car and tires appear on a placard in the passenger car.

For purposes of testing tires and vehicles to determine their compliance with these standards, several variable factors such as the tire's inflation pressure, the load on the tire, and the rim on which the tire is mounted, must be specified. Under the procedures previously followed, when a tire manufacturer intended to introduce a new tire size, it had to submit these variable factors to the agency for inclusion via a rulemaking proceeding in Table I of Appendix A of Standard 109. Until these factors were published in Table I, the new tire size could not be imported into or sold in this country.

Michelin Tire Corporation (Michelin) filed a petition with the National Highway Traffic Safety Administration (NHTSA) requesting that the agency eliminate Table I from Standard 109. Michelin argued that Standard 119, which applies to all motor vehicle tires other than those for passenger cars, has been successfully implemented without any tire tables, and that the provision of Standard 109 requiring tire sizes to appear in Table I needlessly delays the introduction of innovative tire technology.

During its consideration of this petition, NHTSA reexamined its role and that of the various tire standardization organizations in connection with the approval of new tire sizes. These standardization organizations are voluntary associations composed of representatives of each of the member tire companies. The purpose of these standardization organizations is to establish and promulgate engineering standards for tires, rims, and their allied parts. Generally, when a tire manufacturer wanted to introduce a new tire size, it first presented the load and dimensional data on the new size to a standardization organization. The standardization organization checked the data against that derived from its established formulae for computing these data, and if they were accurate, published the data as part of its yearbook. Concurrently, the tire manufacturers associations or individual tire company submitted a petition with the appropriate data to NHTSA, requesting the inclusion of the new size in Table I. This agency then duplicated the work of the standardization organizations, checking to see that the load carrying data were calculated according to the proper formula. If they were, the agency included the tire size in the next routine amendment to Table I. No independent testing of the load carrying capabilities of new tire sizes was ever undertaken by the agency before adding those tires to the table.

NHTSA also considered the effect that deleting Table I would have on the substantive requirements of Standard 109 and on the introduction of new tires. There would be no change in the substantive requirements. Any tire to be sold in the United States would still be required to pass all the performance requirements set forth in the standard. However, there would be a change in the ease with which new tires could be introduced. There would no longer be any situations where a tire which fully complied with all of the requirements of Standard 109 would have its introduction delayed because of the necessity of first listing that size in the standard. With the elimination of the tire table, manufacturers would be able to sell tires in the United States as soon as the manufacturer certified that those tires comply with all of the substantive requirements of Standard 109. Thus, Michelin's petition presented the agency with an opportunity to facilitate the introduction of new technology without relaxing any safety requirements.

The petition also presented the agency with an opportunity to explore the possibility of relying on private standards groups as an alternative to mandatory regulation by a Federal agency. This situation seemed like a particularly excellent opportunity to pursue that alternative since NHTSA was already relying on those organizations' determinations of the validity of their calculations.

Accordingly, because deletion of Table I would enable the agency to remove a requirement that imposed time-consuming administrative burdens and delayed the introduction of new tire technology without providing commensurate safety benefits, the agency decided to issue a proposal deleting that table. The notice of proposed rulemaking (NPRM) was published at 45 F.R. 57466 on August 28, 1980.

The agency received 11 comments on the NPRM. Comments supporting the proposal to eliminate Table I were submitted by

Chrysler, Ford, Michelin, Volkswagen of America, and JATMA (the Japanese standardization organization). Comments opposing the proposal were submitted by General Motors, the Rubber Manufacturers Association (RMA, the trade association representing U.S. tire manufacturers), and the Tire & Rim Association (T&RA, the American standardization organization).

Several commenters stated that, without the tire tables, the intermix controversy could have produced serious safety hazards for persons mounting tires. This controversy involved the only safety issue which has ever arisen in the 14 year history of Table I in connection with a petition to add new tire sizes to that Table. This issue was the possible "intermix" of English unit tires and rims with the more recently introduced metric unit tires designed for use on metric unit rims. Since the sizes of these tires and rims may be a close, but not exact match, it would be possible to mismatch an English unit tire on a metric rim or vice versa. That mismatching could cause the bead of the tire to explode during inflation, or the tire to suddenly lose air while in use.

There were several other comments related to the mismatch controversy. One commenter, a member of the Illinois Vehicle Equipment Safety Commission, stated that before the tire tables could safety be deleted, some amendment would have to be made to Standard 109 to make it impossible to mount tires on rims not compatible with those tires. Similarly, other commenters stated that the agency assumed in the NPRM that the standardization organizations would undertake new duties which historically they have not undertaken, and which they may be unwilling to undertake.

The agency is not aware of explosions due to mismatch ever actually happening. However, the possibility of such explosions was raised as a possibility when NHTSA proposed to add new metric tire sizes to Table I in 1978 and again in 1980 and 1981. Some provision to eliminate the possibility of such intermix would eliminate any potential safety problems which might arise from "mismatches."

Half of this potential problem has already been removed by the routine incorporation of a "blow-by" feature in the new millimetric tires designed for use on millimetric rims. The "blow-by" feature consists of flutes or grooves in the bead area of the tire which prevent the tire from forming a seal with the rim and holding air when the tire is improperly mounted on an English-unit rim. The agency believes that the manufacturers are very unlikely to stop incorporating this feature on these tires because its use is so simple and inexpensive. Also discontinuance would expose the tire manufacturer to a product liability suit if the tire failed as a result of being intermixed. Accordingly, the agency believes it is reasonable to assume that the problem of intermix of English-unit rims with the millimetric tires will not be a problem in the future.

The agency recognizes that there is apparently no similarly simple design change currently used to prevent an intermix of an English-unit tire with the millimetric rims designed for use with millimetric tires. The agency is considering several options to deal with this situation. One option is the adoption of minimum and maximum well depths for these rims. These requirements prevent an English-unit tire from "buttonholing" on the millimetric rim. "Buttonholing" refers to the process of stretching the beads of a tire over the flange of the rim and derives its name from its similarity to the process of manipulating a bottonhole so that it fits over a button. T&RA already has a practice of adopting well depth requirements for these rims. Also, the European Tyre Rim and Technological Organization (ERTRTO) has recently established well depth requirements for some millimetric rims. If these requirements were adopted by all of the standardization organizations, they would effectively eliminate the possibility of any intermixing English-unit tires with these rims.

Another option would be for NHTSA to propose requiring that the rim size be labeled on passenger car rims. Such a requirement would parallel the existing requirement in Standard 120 that the rim size be labeled on previously followed, when a tire manufacturer intended to introduce a new tire size, it had to submit these variable factors to the agency for inclusion via a rulemaking proceeding in Table I of Appendix A of Standard 109. Until these factors were published in Table I, the new tire size could not be imported into or sold in this country.

Michelin Tire Corporation (Michelin) filed a petition with the National Highway Traffic Safety Administration (NHTSA) requesting that the agency eliminate Table I from Standard 109. Michelin argued that Standard 119, which applies to all motor vehicle tires other than those for passenger cars, has been successfully implemented without any tire tables, and that the provision of Standard 109 requiring tire sizes to appear in Table I needlessly delays the introduction of innovative tire technology.

During its consideration of this petition, NHTSA reexamined its role and that of the various tire standardization organizations in connection with the approval of new tire sizes. These standardization organizations are voluntary associations composed of representatives of each of the member tire companies. The purpose of these standardization organizations is to establish and promulgate engineering standards for tires, rims, and their allied parts. Generally, when a tire manufacturer wanted to introduce a new tire size, it first presented the load and dimensional data on the new size to a standardization organization. The standardization organization checked the data against that derived from its established formulae for computing these data, and if they were accurate, published the data as part of its yearbook. Concurrently, the tire manufacturers associations or individual tire company submitted a petition with the appropriate data to NHTSA, requesting the inclusion of the new size in Table I. This agency then duplicated the work of the standardization organizations, checking to see that the load carrying data were calculated according to the proper formula. If they were, the agency included the tire size in the next routine amendment to Table I. No independent testing of the load carrying capabilities of new tire sizes was ever undertaken by the agency before adding those tires to the table.

NHTSA also considered the effect that deleting Table I would have on the substantive requirements of Standard 109 and on the introduction of new tires. There would be no change in the substantive requirements. Any tire to be sold in the United States would still be required to pass all the performance requirements set forth in the standard. However, there would be a change in the ease with which new tires could be introduced. There would no longer be any situations where a tire which fully complied with all of the requirements of Standard 109 would have its introduction delayed because of the necessity of first listing that size in the standard. With the elimination of the tire table, manufacturers would be able to sell tires in the United States as soon as the manufacturer certified that those tires comply with all of the substantive requirements of Standard 109. Thus, Michelin's petition presented the agency with an opportunity to facilitate the introduction of new technology without relaxing any safety requirements.

The petition also presented the agency with an opportunity to explore the possibility of relying on private standards groups as an alternative to mandatory regulation by a Federal agency. This situation seemed like a particularly excellent opportunity to pursue that alternative since NHTSA was already relying on those organizations' determinations of the validity of their calculations.

Accordingly, because deletion of Table I would enable the agency to remove a requirement that imposed time-consuming administrative burdens and delayed the introduction of new tire technology without providing commensurate safety benefits, the agency decided to issue a proposal deleting that table. The notice of proposed rulemaking (NPRM) was published at 45 F.R. 57466 on August 28, 1980.

The agency received 11 comments on the NPRM. Comments supporting the proposal to eliminate Table I were submitted by

Chrysler, Ford, Michelin, Volkswagen of America, and JATMA (the Japanese standardization organization). Comments opposing the proposal were submitted by General Motors, the Rubber Manufacturers Association (RMA, the trade association representing U.S. tire manufacturers), and the Tire & Rim Association (T&RA, the American standardization organization).

Several commenters stated that, without the tire tables, the intermix controversy could have produced serious safety hazards for persons mounting tires. This controversy involved the only safety issue which has ever arisen in the 14 year history of Table I in connection with a petition to add new tire sizes to that Table. This issue was the possible "intermix" of English unit tires and rims with the more recently introduced metric unit tires designed for use on metric unit rims. Since the sizes of these tires and rims may be a close, but not exact match, it would be possible to mismatch an English unit tire on a metric rim or vice versa. That mismatching could cause the bead of the tire to explode during inflation, or the tire to suddenly lose air while in use.

There were several other comments related to the mismatch controversy. One commenter, a member of the Illinois Vehicle Equipment Safety Commission, stated that before the tire tables could safety be deleted, some amendment would have to be made to Standard 109 to make it impossible to mount tires on rims not compatible with those tires. Similarly, other commenters stated that the agency assumed in the NPRM that the standardization organizations would undertake new duties which historically they have not undertaken, and which they may be unwilling to undertake.

The agency is not aware of explosions due to mismatch ever actually happening. However, the possibility of such explosions was raised as a possibility when NHTSA proposed to add new metric tire sizes to Table I in 1978 and again in 1980 and 1981. Some provision to eliminate the possibility of such intermix would eliminate any potential safety problems which might arise from "mismatches."

Half of this potential problem has already been removed by the routine incorporation of a "blow-by" feature in the new millimetric tires designed for use on millimetric rims. The "blow-by" feature consists of flutes or grooves in the bead area of the tire which prevent the tire from forming a seal with the rim and holding air when the tire is improperly mounted on an English-unit rim. The agency believes that the manufacturers are very unlikely to stop incorporating this feature on these tires because its use is so simple and inexpensive. Also discontinuance would expose the tire manufacturer to a product liability suit if the tire failed as a result of being intermixed. Accordingly, the agency believes it is reasonable to assume that the problem of intermix of English-unit rims with the millimetric tires will not be a problem in the future.

The agency recognizes that there is apparently no similarly simple design change currently used to prevent an intermix of an English-unit tire with the millimetric rims designed for use with millimetric tires. The agency is considering several options to deal with this situation. One option is the adoption of minimum and maximum well depths for these rims. These requirements prevent an English-unit tire from "buttonholing" on the millimetric rim. "Buttonholing" refers to the process of stretching the beads of a tire over the flange of the rim and derives its name from its similarity to the process of manipulating a bottonhole so that it fits over a button. T&RA already has a practice of adopting well depth requirements for these rims. Also, the European Tyre Rim and Technological Organization (ERTRTO) has recently established well depth requirements for some millimetric rims. If these requirements were adopted by all of the standardization organizations, they would effectively eliminate the possibility of any intermixing English-unit tires with these rims.

Another option would be for NHTSA to propose requiring that the rim size be labeled on passenger car rims. Such a requirement would parallel the existing requirement in Standard 120 that the rim size be labeled on rims other than passenger car rims. Compliance with that requirement has apparently been accomplished in a fairly simple and inexpensive manner. If the rim size were labeled on car rims, any person mounting a tire could compare the rim size with the tire size required to be labeled on the tire and thereby ensure that the tire and rim sizes were compatible.

Both of these options would effectively minimize the chances of a dangerous intermix actually occurring. In view of the substantial role already played by the standardization organizations in establishing tire load and dimensional specifications, the agency believes that it is appropriate to allow those organizations to solve the potential problem by adopting minimum and maximum well depth requirements for millimetric rims. If these organizations do not undertake to establish these requirements as routine matter, the agency will examine further the desirability of proposing to require that the rim size be labeled on passenger car rims.

Some commenters stated that deletion of Table I would remove the only single source for determining proper loads and dimensions for all tires used in the United States. The loss of that single source was asserted to be significant, because the foreign standardizing bodies do not list all the information shown in the table. It was suggested that persons desiring to obtain that information would encounter greater difficulty in locating it.

NHTSA agrees that there will not be any single source for this information when Table I is abolished. However, NHTSA does not believe and the commenters do not allege that the loss of that single source would create any significant problems for current users of this table. The three possible users are: (1) a car manufacturer deciding on the most appropriate tires for use on a new or redesigned model; (2) a tire dealer replacing tires on a consumer's car; or (3) this agency when it is testing the tires for compliance with Standard 109. The sources of expertise and information available to car manufacturers and their experience in regularly purchasing large quantities of tires for their new cars make it possible for those manufacturers to maintain full knowledge of all possible tire sizes which could be used on their cars without having to resort to consulting Table I. The tire dealer has limited need for information about the wide variety of tires in Table I since most tire replacements are believed to involve simply using the same tire size already on the car. With respect to those instances in which a different tire size is used, the agency believes that it is most likely that the tire dealer simply consults the booklets published by the individual tire manufacturers or one of the yearbooks published by the standardization organizations to determine an appropriate tire size. It seems improbable that a tire dealer consults a copy of Title 49, *Code of Federal Regulations* before installing replacement tires on a consumer's car. In the case of this agency, NHTSA can obtain information from the appropriate yearbooks or from the individual tire manufacturers before testing the tires. The data from these sources, together with the information labeled on the sidewall of the tire, will provide all the information that this agency needs to test the tires. Thus, it does not appear that any of the parties which might potentially derive some benefit from the convenience of a single source of specifications for all tire sizes will have any difficulty obtaining the information they need without this single source.

The agency's belief that a single source is not indispensable is borne out by the experience with truck tires under Standard 119. Unlike Standard 109, Standard 119 does not contain a single listing of all tire sizes. Yet, in the eight years since Standard 119 became effective, there have not been any reported safety problems or difficulties that were attributed to any limitation on the availability of specifications for the various sizes. Truck manufacturers have not had any reported problems in deciding on appropriate tires nor have tire dealers had problems selecting appropriate replacement sizes. Further, there have not been any problems for the agency in determining the appropriate tire specifications for compliance testing purposes.

While not indicating why it believed that the absence of Table I might create problems for car manufacturers and tire dealers, one commenter argued that the experience with Standard 119 is not relevant as a guide for what would result under Standard 109 without tire tables because of the differences in marketing car and truck tires. The agency agrees that buyers of truck tires are generally more knowledgeable about their purchase. It agrees also that there is not as great a variety of truck tire sizes as there is for car tire sizes. However, the significance of these differences is substantially diminished by the reliance of car tire purchasers on the knowledge of tire dealers about the specifications of the new car tires. Since tire dealers typically sell tires made by only a few tire manufacturers, the dealers need to know the capabilities of only those manufacturers' tires. They gain this knowledge from the information booklets distributed by the individual manufacturers and from the standardization organization yearbooks. Since deletion of Table I will have no affect on the continued availability of these sources, dealers will still be able to rely on them in the future.

A commenter argued that deletion of the tire table would allow a single manufacturer to introduce tires and rims incompatible with existing ones, giving rise to safety problems. Absent Table I, this commenter argued that there would be no opportunity for advance notice and scrutiny of these potential conflicts. NHTSA does not agree with this comment. The degree of care induced by the possibility of product liability suits and unfavorable publicity make it unlikely that a manufacturer would knowingly introduce tire and rim sizes which might actually cause safety problems. It is possible that, in spite of reasonable care on the part of the manufacturer, tire or rim sizing could inadvertently give rise to some other safety problems, such as those that theoretically might have occurred as a result of the potential for intermix. Since the only potential problem identified to date is intermix and that problem is likely to be foreclosed as suggested above, it is difficult to foresee what that other safety problem might be. However, if a specific new type of safety problem actually does arise, NHTSA can use its authority under the Safety Act to take appropriate action in response to that concrete situation.

Some commenters stated that the deletion of Table I would lead to proliferation of tire sizes. Commenters stated also that because the formula used by the foreign tire manufacturers to calculate the load-carrying capability of their tires differs from that used by the U.S. manufacturers, the deletion of Table I could result in a proliferation of load schedules for the same size tires. These commenters argued that this proliferation would make it possible for a consumer to buy a replacement tire with the proper size, but insufficient load-carrying capacity for his or her car.

The agency does not believe that deletion of Table I would lead to a proliferation of either tire sizes or load schedules or create a safety problem. The mere existence of the table does not exclude the possibility of multiple load schedules. In the case of several tire sizes, there are already varying load schedules listed for each of those tire sizes. (See, for instance, the values shown for the 225/70 R15 size in Tables I-T and I-JJ. The domestic version of this tire size is preceded by the letter "P," but the dimensions of the tires are identical.)

Like the problem of intermix, the proliferation of tire sizes and load schedules has occurred notwithstanding the existence of Table I. This is because Table I was never intended to serve as a barrier to any manufacturer either introducing any new tire size it wanted, provided that appropriate data for that tire size were listed in the table, or determining the load schedule appropriate for its tires. Table I was designed to be nothing more than it is, i.e., a simple listing of tire sizes. It is not a mechanism for regulating or controlling the number or variety of those sizes or load schedules. The appropriate mechanisms for considering any safety problems regarding tires are proceedings to determine whether new performance requirements should be established or whether a finding of safety-related defect should be made.

These variations in sizes and load schedules have occurred since the load schedules in Table I are freely drawn from the yearbooks of the standardization organizations and since these organizations permit different load schedules to be established for the same tire size. Since the table has had no influence on the incidence of load schedule proliferation, it is not reasonable to suppose that deletion of the table will have any influence on the extent of proliferation either.

NHTSA does not believe that the existence of different load schedules for the same tire size will create any safety problems. The agency has not received reports of any safety problems or of any incidents in which consumers have had tires with insufficient load-carrying capacity installed on their cars. There are several other factors which underlie the agency's belief. An amendment adopted by this rule requires that the load rating for a tire be equal to or greater than a load rating published for that tire size in the yearbook of one of the standardization organizations. This phraseology differs slightly from that proposed in the NPRM. This nonsubstantive change was made in response to a request by JATMA that the provision be worded so that it would exactly parallel the language of Standard 119. This allows a manufacturer or standardization organization to specify that its tire can carry a greater load than has been published for that size, and be subjected to a more strenuous test by this agency.

More important, the agency believes that deletion of Table I will not reduce the incentive tire dealers have to make certain that the maximum load capability of the tires they sell to consumers is not less than that of the consumers' old tires. Notwithstanding the deletion of the table, the dealers will continue to exercise great care in order to avoid tort liability for selling tires with insufficient maximum load capability. The maximum load of each tire is required to be labeled on the tire by Standard 109. Thus, it does not matter what load schedules are published for that size. To ensure that the replacement tire is appropriate for the vehicle, the dealer can compare the load-carrying capability with the weight of the vehicle on each axle. That information is required to be labeled on the vehicle by Part 567.

The agency disagrees with the suggestion by some commenters that, absent the process of adding new tire sizes to Table I, there would not be any forum for addressing any international concerns about safety problems that might arise regarding new tire sizes. Under section 124 of the Safety Act, domestic and foreign parties could petition the agency to commence rulemaking or defect proceedings to address such problems. Rulemaking and defect proceedings are initiated in response to a petition when the agency finds that the petitioner sufficiently demonstrates the likely existence of a significant safety problem. If proceedings were commenced regarding any tire safety problems, those parties would also have the opportunity to participate in those proceedings.

Further, the membership of the standardization organizations is international. Since all of the tire companies are members of at least one of the tire standardization organizations, they are fully informed about the tire sizes that the standardization organizations are considering be added to their yearbooks. For instance, Firestone, Goodyear, Uniroyal, Goodrich, and Mohawk are all members of the ETRTO and the STRO (the Scandinavian standardization organization), as well as the T&RA. Thus, there is ample opportunity for these companies to present their views on tire and rim sizing to these organizations, and have these groups address the merits of those views. In the same way, the foreign tire manufacturers are affiliated members of T&RA. They can present any objections they might have regarding tire and rim sizing to that organization. NHTSA believes that these organizations will give any objections a full consideration. If a tire manufacturer is dissatisfied with the response to its objections, it can submit an appropriate petition to NHTSA.

Chrysler, Ford, and General Motors all

urged that if the standard were to be revised by deleting Table I, the procedures for conducting the high speed performance test should be revised so that they do not require testing a tire at only 85 percent of its maximum load as proposed in the NPRM. These commenters explained that the 85 percent figure would require them to use larger tires on some of their models even though there isn't any evidence that the tire sizes currently being used by the vehicle manufacturers are causing any safety problems.

In proposing use of the 85 percent figure, NHTSA was unaware of this possibility. It did not intend that deleting Table I would have the indirect effect of necessitating the use of larger tires by the vehicle manufacturers.

The car manufacturers suggested two possible revisions in the high speed test requirement that would avoid having to increase the size of any tires. General Motors suggested that NHTSA use the same reference to the intermediate load formerly shown in Standard 109, but that instead of referring to the intermediate load column in Table I, refer to the intermediate load column in the yearbooks of the various standardization organizations. NHTSA notes that there would be a problem with this suggestion. Only the American standardization organization publishes the intermediate loads which would be needed for the high speed test. Thus, if the agency adopted this approach, all foreign standardization organizations would be forced to publish intermediate loads. This step is unnecessary since the agency has accepted an alternative suggestion by other commenters.

Chrysler and Ford both suggested that the load on the tires during the high speed test be increased from the proposed 85 percent of the load at the maximum permissible inflation pressure to 88 percent of that load. This change, according to both companies, would eliminate any need for using larger tires. The agency agrees. Accordingly, this suggestion is adopted in this final rule.

Two commenters urged that the dimensional requirements be deleted from Standard 109. JATMA argued that these requirements are unnecessary because manufacturers will, as part of their quality control program, produce tires whose dimensions conform with those on the tires' labels. JATMA stated that there have not been any safety problems with improperly sized truck tires even though Standard 119 has no dimensional requirements. It stated also that there have not been any problems with improperly sized rims even though neither Standard 110 nor Standard 120 have any dimensional requirements. NHTSA believes that these arguments are accurate, but is unable to adopt the commenters' suggestions in this final rule. A substantive change to a standard cannot be adopted without giving the public an opportunity to comment on the proposed change. Since the NPRM did not indicate that the agency was considering such a step, it cannot be adopted in this final rule. The agency will consider initiating rulemaking to eliminate these requirements from Standard 109 in the future based on the reasons given by JATMA.

Michelin also argued that the dimensional requirements should be deleted because the language in the NPRM referring to these requirements would have effectively prohibited an individual manufacturer from introducing new tire sizes without the approval of some standardization organization. Standard 109 currently allows tire manufacturers desiring to introduce a new tire size either to use the data listed in one of the standardization organization yearbooks for the tire size or to develop their own data for the tire and submit it to NHTSA without first coordinating with any standardization organization. Regardless of their source, these data were submitted to NHTSA for inclusion in Table I. When the tire size and its data were included, the tires of that size were tested in accordance with the included data.

The NPRM proposed two changes in the current procedure. First, the agency proposed to eliminate Table I so that data for new tire sizes would not have to be included in that table prior to the importation or sale of new tires of those sizes. Second, the agency proposed that all new tire sizes would have to be accepted by some standardization organization prior to importation or sale.

Michelin objected to the second proposal. The agency agrees that its goal of facilitating the introduction of new tire technology would be best served if the standardization organizations were not indirectly given ultimate authority over the tire manufacturers in the area of tire sizing. Accordingly, the agency has not adopted that second proposal. Instead, the agency has specified in the amendments made by this notice that, as under the current standard, tire manufacturers may either use the dimensional data published by one of the standardization organizations or furnish the data directly to NHTSA, each of its dealers, and, if requested, to members of the public.

As another reason for retaining Table I, several commenters observed that the NPRM would have required the size factor of tires to be at least as large as that published by one of the standardization organizations even though the foreign standardization organizations do not publish the size factor dimension. This observation is correct, but in a technical sense only. While the yearbooks do not contain the size factor, they do contain equivalent information. Every yearbook specifies a tire's overall diameter and section width. Added together, these dimensions equal the size factor.

The deletion of Table I from Standard 109 becomes effective 180 days after this notice is published in the *Federal Register*. The 180-day period will give the tire manufacturers and the various standardization organizations an opportunity to examine the yearbooks to ensure that all of the sizes currently listed in Table I of Standard 109 are shown in one of the yearbooks.

JATMA requested that the agency state in this preamble that tire sizes which are currently listed in Table I may be produced after the table is deleted. That organization did not explain what problem, if any, prompted this comment. Most tire sizes in Table I are already in at least one of the yearbooks of the standardization organizations. It is only the very old or very new tire sizes that might not be in one of the yearbooks. Addition of the data for those sizes to a yearbook should be a fairly simple process since the data for those sizes already exist in Table I. The leadtime of 180 days provided by this notice should provide ample time for the manufacturers and standardization organizations to add that data. JATMA and the other standardization organizations should check the tire sizes to be listed in their 1982 yearbooks to be sure that all of the sizes that their members plan to sell in the United States are among those listed sizes.

NHTSA has analyzed the impacts of this action and determined that this action is not "major" within the meaning of Executive Order 12291 or "significant" within the meaning of the Department of Transportation regulatory policies and procedures. The principal impacts of adopting this rule will be to reduce unnecessary paperwork burdens for the manufacturers and to facilitate the introduction of new technology in tires. As a result, there will be some cost savings for the manufacturers. Also, both innovative tire manufacturers and consumers will benefit from the earlier introduction of new tire technology. A regulatory evaluation regarding these impacts has been prepared and placed in the docket for this action. Copies of the evaluation may be obtained by writing the Docket Section or calling it at (202) 426-2768.

The agency has considered the environmental implications of this rule in accordance with the Environmental Policy Act of 1969 and determined that this rule will not significantly affect the human environment.

The *Regulatory Flexibility Act* is not applicable to this rule since that Act applies only to rulemaking proceedings in which the NPRM was issued on or after January 1, 1981. The NPRM in this rulemaking action was issued in August 1980. If that Act were applicable, NHTSA would have determined that this rule will not "have a significant economic impact on a substantial number of small entities" and that a Regulatory Flexibility Analysis was therefore not required. The reduced costs resulting from this rule do not have a significant effect on the tire manufacturers. Further, the agency believes that few of the tire manufacturers would qualify as small businesses. Any tire manufacturers that do qualify as small businesses will enjoy the same reduction of paperwork and opportunity to avoid delays in the introduction of new tire sizes as the larger manufacturers. Small governmental units and small organizations are generally affected by amendments to the Federal Motor Vehicle Safety Standards as purchasers of new motor vehicle and new motor vehicle equipment. Since this rule will not significantly affect the price of tires, small governmental units and small organizations will not be affected.

Issued on December 8, 1981.

Diane K. Steed
Acting Administrator
46 F.R. 61473
December 17, 1981

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires

(Docket No. 82-10; Notice 1)

ACTION: Final rule.

SUMMARY: Pursuant to petitions filed by Michelin Tire Corporation (Michelin) and the European Tyre and Rim Technical Organization (ETRTO), this notice amends Federal Motor Vehicle Safety Standard No. 109, *New Pneumatic Tires—Passenger Cars*, by adding certain tire size designations to Table I of Appendix A of that standard. This amendment permits the introduction into interstate commerce of the new tire sizes.

EFFECTIVE DATE: June 2, 1982, if no objections are received from commenters before that date.

SUPPLEMENTARY INFORMATION: According to agency practice, NHTSA responds to petitions for adding new tire sizes to Table I of Appendix A of Standard No. 109 by quarterly issuing final rules under an abbreviated rulemaking procedure for expediting such routine amendments. Guidelines for this procedure were published at 33 F.R. 14964, October 5, 1968, and were amended at 36 F.R. 8298, May 4, 1971; 36 F.R. 13601, July 22, 1971; and 39 F.R. 28980, August 13, 1974. Those guidelines provide that these final rules become effective June 2, 1982 if no comments are received objecting to the final rules during this 30-day period. If objections are received, regular rulemaking procedures for issuing and amending motor vehicle safety standards are initiated.

Michelin petitioned to add two tire sizes to existing tables. Additionally, Michelin petitioned for the addition of a new tire table, and requested that six new tire sizes be included in that new table, ETRTO requested the addition of one new tire size to an existing table, and requested that a new table be established for a new tire size.

The bases for accepting or denying requests to add new tire size designations to the tire tables are set forth in the introductory guidelines to Appendix A. Briefly, the tests are the appropriateness of the information submitted for inclusion in the tire tables and the appropriateness of the location within the tables of the requested tire size. The ten new sizes included in this notice meet these criteria. Accordingly, the Michelin and ETRTO petitions are granted, and ten new tire sizes are added to Table I of Appendix A of the standard pursuant to the abbreviated rulemaking procedures.

NHTSA expects that this may be the last time it uses these abbreviated rulemaking procedures, because it has published a final rule deleting Table I from Appendix A of Standard 109 (46 F.R. 61473, December 17, 1981). That rule becomes effective June 15, 1982, at which time Table I will be deleted and no further petitions for additions will be necessary. The agency is presently considering several petitions for a reconsideration of that rule.

In consideration of the foregoing, 49 CFR 571.109 is amended as specified below, subject to the 30-day comment period outlined above:

1. Table I of Appendix A is amended by adding the following sizes and corresponding values to Table I-H, I-QQ, I-RR, and I-AAB:

Table I.—H Tire Load Ratings, Test Rims, Minimum Size Factors, and Section Widths for "R" Type Radial Ply Tires

Tire size[1] designation	Maximum tire loads (pounds) at various cold inflation pressures (psi)													Test rim width (inches)	Minimum size factor (inches)	Section width[2] (inches)
	16	18	20	22	24	26	28	30	32	34	36	38	40			
175R16	920	980	1,040	1,100	1,160	1,210	1,260	1,310	1,360	1,400	1,450	1,490	1,540	5	33.49	7.00

[1] The letters "H," "S," or "V" may be included in any specified tire size designation adjacent to the "R."

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

Table I.—QQ Tire Load Ratings, Test Rims, Minimum Size Factors, and Section Widths for "55" Series All Millimetric Radial Ply Tires for (TR or JM Rims)

Tire size[1] designation	Maximum tire loads (pounds) at various cold inflation pressures (psi) 16	18	20	22	24	26	28	30	32	34	36	38	40	Test rim width (mm)	Minimum size factor (mm)	Section width[2] (mm)
200/55R390	790	845	895	940	990	1,030	1,075	1,115	1,155	1,195	1,235	1,270	1,310	150	801	204

[1] The letters "H," "S," or "V" may be included in any specified tire size designation adjacent to the "R."

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

Table I.—RR Tire Load Ratings, Test Rims, Minimum Size Factors, and Section Widths for 'P/65' Series ISO Type Tires

Tire size[1] designation[3]	Maximum tire loads (kilograms) at various cold inflation pressures (kPa)[4] 120	140	160	180	200	220	240	260	280	Test rim width (inches)	Minimum size factor (mm)	Section[2] width (mm)
P185/65R365	365	395	425	450	470	495	520	....	...	135	779	187

[1] The letters "D" for diagonal and "B" for bias belted may be used in place of the "R."

[2] Actual section width and overall width shall not exceed the specified width by more than the amount specified in S4.2.2.2.

[3] The letters "H," "S," or "V" may be included in any specified tire size designation adjacent to the "R."

[4] The designated cold inflation pressures may be increased to a maximum of 300kPa to meet special vehicle requirements.

Table I.—AAB Tire Load Rating, Test Rims, Minimum Size Factors, and Section Widths for T'90' Series 60 Lb/In^2 Tires

Tire size[1] designation[3]	Maximum tire loads (Pounds at 60 psi cold inflation pressure)	Test rim width (inches)	Minimum size factor (inches)	Section width[2] (inches)
T115/90R13	1,225	3½	25.43	4.65

[1] The letters "D" for diagonal and "B" for bias belted may be used in place of the "R."

[2] Actual section width and overall width shall not exceed the specified width by more than the amount specified in S4.2.2.2.

2. Table I of Appendix A is amended by adding two new tables, Tables I-AAC and I-AAD, with the following tire sizes included therein:

Table I.—AAC Tire Load Rating, Test Rims, Minimum Size Factors, and Section Widths for T'110' Series 60 LB/In^2 Tires

Tire size[1] designation[3]	Maximum tire loads (pounds at 60 psi cold inflation pressure)	Test rim width (inches)	Minimum size factor (inches)	Section[2] width (inches)
T95/110R13	925	3	24.76	3.90
T95/110R14	990	3	25.79	3.90
T95/110R15	1,035	3	26.77	3.90
T115/110R13	1,280	3½	27.17	4.65
T115/110R14	1,355	3½	28.19	4.65
T115/110R15	1,430	3½	29.17	4.65

[1] The letters "D" for diagonal and "B" for bias belted may be used in place of the "R."

[2] Actual section width and overall width shall not exceed the specified width by more than the amount specified in S4.2.2.2.

Table I.—AAD Tire Load Ratings, Test Rims, Minimum Size Factors, and Section Widths for Series "R" Type Radial

Tire size[1] designation	Maximum tire loads (pounds) at various cold inflation pressures (psi) 16	18	20	22	24	26	28	30	32	34	36	38	40	Test rim width (inches)	Minimum size factor (inches)	Section width[2] (inches)
215/80R16	1,290	1,380	1,460	1,540	1,620	1,690	1,770	1,830	1,900	1,970	2,030	2,090	2,150	6	37.38	8.50

[1] The letters "H," "S," or "V" may be included in any specified tire size designation adjacent to the "R."

[2] Actual section width and overall width shall not exceed the specified section width by more than 7 percent.

Interested persons are invited to submit comments on these additions. Comments must be limited so as not to exceed 15 pages in length. Necessary attachments may be appended without regard to the 15-page limit. This limitation is intended to encourage commenters to detail their primary arguments in a concise fashion. Those persons desiring to be notified upon receipt of their comments in the rules docket should enclose a self-addressed, stamped postcard in the envelope with their comments. When the comments are received, the docket supervisor will return the postcard by mail.

The agency has reviewed the impacts of this rule and determined that they are limited to permitting the introduction of the newly listed tire sizes by those manufacturers wishing to do so. The rule does not impose any regulatory burden on any manufacturer. The rule increases the availability of new tire sizes to the public. Accordingly, NHTSA has determined that this rule is neither major within the meaning of Executive Order 12291 nor significant within the meaning of the Department of Transportation regulatory policies and procedures. Further, the agency reviewed this amendment under the National Environmental Policy Act and determined that the rule will have no significant effects on the human environment.

The program official and attorney principally responsible for the development of this rule are John A. Diehl and Stephen Kratzke, respectively.

Issued on April 23, 1982.

Courtney M. Price
Associate Administrator
for Rulemaking

47 F.R. 18904
May 3, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 109

New Pneumatic Tires—Passenger Cars
(Docket No. 80-14; Notice 5)

ACTION: Response to petitions for reconsideration; final rule.

SUMMARY: This agency received five petitions for reconsideration of its final rule deleting Table I from Federal Motor Vehicle Safety Standard No. 109. Subsequently, one of the petitioners filed another petition "renewing" its petition for reconsideration. In response to these petitions, the agency is making the following editorial changes to the final rule previously published:

(1) The maximum load for a tire size need not be published in a standardization organization publication, but can be submitted by an individual manufacturer to this agency and to the manufacturer's tire dealers along with the other required technical information related to that new tire size.

(2) The maximum load labeled on the tire sidewall will be used to determine test conditions for the tire in the bead unseating test for temporary spare tires and determining the maximum permissible vehicle load on the tires for purposes of Standard No. 110. The final rule specified that the maximum loads published in a standardization organization yearbook or submitted to this agency by an individual manufacturer would be used as a reference.

(3) The name of the Japanese standardization organization is corrected.

This notice defers action on the requests to change the loading for the high speed test. Recent amendments to the Uniform Tire Quality Grading Standards (UTQGS) have resulted in different tests being specified for the temperature resistance test in UTQGS and the high speed test in Standard No. 109. NHTSA has requested comments on possible means of specifying the same test procedures for these tests. No final comments have been analyzed.

This notice also denies several requests for amendments. Specifically, it denies requests (1) to maintain a requirement for a minimum size factor, because the agency does not believe that any tire manufacturer will undersize its tires; (2) to alter the testing references for the endurance test, because no data or analyses were presented to suggest that these changes from the old endurance test procedures would pose any testing difficulties or significant changes from the procedures followed with Table I; and (3) to continue advance public notice of the introduction of new tire sizes or tire/rim concepts, because no safety purpose would be served by such advance notice.

EFFECTIVE DATE: The slight editorial changes made herein become effective August 19, 1982.

SUPPLEMENTARY INFORMATION: NHTSA has published a final rule deleting Table I from Federal Motor Vehicle Safety Standard No. 109 (49 CFR 571.109) at 46 F.R. 61473; December 17, 1981. Table I was a listing of dimensional and loading information for all passenger car tire sizes. This information has been used by this agency for testing tires for compliance with Standard No. 109 and for determining the appropriateness of the tires for use on particular vehicles in accordance with Standard No. 110. In so acting, NHTSA determined that Table I was not necessary to obtain these testing specifications, since they could be determined from the information labeled on the sidewall on the tires. No other safety-related justifications for retaining the listing were found to exist. Additionally, the agency's experience with administering this listing suggested that the process caused delays in the introduction of new tires and tire concepts and allowed competitors a chance to develop their own version of the new tires. Based on these considerations, NHTSA dropped the Table I from Standard No. 109, effective June 15, 1982.[1]

Five petitions for reconsideration of that final rule were submitted to the agency. The agency has carefully considered those petitions and granted them to the extent set forth below.

Source of load rating for a tire size. One petitioner, Michelin, generally supported the final rule, but objected to the requirement in section S4.2.1 of Standard No. 109 that the load rating for a tire size be listed in a publication of a standardization organization.[2] According to Michelin, the requirement would allow the standardization organizations to block the listing of a new tire size for reasons unrelated to safety, thereby preventing the introduction of the tire.

NHTSA has no information indicating that any standardization organization would behave in this fashion, and Michelin did not mention any standardization organization with which it had such an experience. In addition, however, in the final rule the agency had inadvertently omitted an alternative to this requirement. The dimensional specifications, test rim widths, and inflation pressure information for a new tire size are permitted by the December final rule either to be published in a standardization organization yearbook or to be submitted directly to the agency by an individual manufacturer. NHTSA intended to treat the maximum load information in the same manner as this other information, and the rule is amended now to do so. This change requires a conforming amendment to Section S4.3.1(c) of Standard No. 110, which also specified that the loading information be published by a standardization organization publication.

The agency also received a petition for reconsideration from Japan Automobile Tire Manufactures' Association, Inc. (JATMA), the Japanese standardization organization. This organization generally supported the final rule, but requested three editorial changes.

Japanese tire standardization organizations. First, JATMA asked that their organization be listed as the Japanese standardization organization. The standardization organization currently listed, Japanese Industrial Standards, is an organization for all Japanese industry, not just tires, and does not publish yearbooks showing tire load ratings and inflation pressures. Accordingly, this rule is amended to list JATMA as the Japanese standardization organization.

Source of maximum load rating used to determine test conditions. Second, JATMA asked that Section S4.2.2.3(c) of Standard No. 109 (the bead unseating test for temporary spare tire sizes) and Section S4.2.1. of Standard No. 110 (the vehicle maximum load on the tires) be revised to specify that the maximum load ratings marked on the tire's sidewall be the reference used by the agency to determine the testing conditions. The final rule specified the use of the maximum load published in a standardization organization publication or submitted by an individual manufacturer. That rule already uses the maximum load marked on the sidewall to determine the test conditions for the high speed and endurance tests for Standard No. 109. Such a change would simplify the determination of test conditions for these latter tests and make them consistent with the other tests in Standard No. 109. Accordingly, JATMA's second requested change to the final rule previously published is adopted.

Clarification of references to maximum load ratings. Third, JATMA suggested a revision of section S4.2.1 of Standard No. 109 to clarify the references to maximum load ratings at the end of that section. As already noted, this section has been revised so as to permit manufacturers to individually submit maximum load ratings. In the course of that revision, the agency has clarified the references JATMA addressed in this comment.

The other three petitions for reconsideration indicated that there were more serious problems with the previously published final rule. The three petitioners were the Rubber Manufactuers Association (RMA), a trade association composed of domestic tire manufacturers, Goodyear Tire & Rubber Co. (Goodyear), and the Copper Tire Company (Cooper).

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[1] Persons interested in obtaining a copy of Table I as it existed on June 14, 1982, may do so by writing to the Docket Section or calling it at (202) 426-2768.

[2] Standardization organizations are voluntary associations composed of representative of each of the member tire companies. The purpose of these standardization organizations is to establish and promulgate sound engineering standards for tires, rims, and their allied parts.

Minimum tire size factor. All three of these petitioners objected to the requirement in the rule deleting the requirement for a minimum size factor. The essence of these objections was that, absent a minimum size factor, it would be possible for manufacturers to undersize their tires, and that this undersizing could lead to increased incidents of tire failure.

NHTSA still does not believe that a requirement for a minimum size factor is necessary. The size factor of a tire cannot change after the mold is set up to begin producing that size of tire. With all of the engineering and quality control effort involved in designing and producing new tire sizes, it is simply implausible that a tire manufacturer would either intentionally or inadvertently undersize the molds. The undersized tires that would be produced might save the manufacturers a few dollars per tire, but the savings would be more than offset by product liability awards and negative publicity generated. Since automobile manufacturers design cars to a tire's rated load, undersized tires would be overloaded on those cars, and would predictably exhibit higher failure rates than properly sized tires made by other manufacturers. This appears to be a very compelling disincentive to undersizing tires. Hence, the agency concludes that the minimum size factor is not needed in Standard No. 109.

Loading for endurance test. In addition, all three of these petitioners urged the agency to reconsider the changes in the loading of the tires for the endurance tests of Standard No. 109. For that test, Standard No. 109 formerly specified that tires be run for designated periods of time with the loads shown in various inflation columns in Table I. These loads averaged 85 percent of the maximum load of the tire for 4 hours, 93 percent of the maximum load for 6 hours, and 100 percent of the maximum load for 24 hours. Under the new rule published last December, the loads are now 85 percent for 4 hours, 90 percent for 6 hours, and 100 percent for 24 hours. In other words, there is a slight decrease in loading of three percent during the 6 hour phase of this test, while the loading for the other two phases remain constant.

NHTSA does not believe that this slight change will effect the results of the endurance test or its validity as a check of a tire's endurance. The commenter who addressed this issue noted only that there was a change in the 6 hour phase of the test and did not provide any explanation of why they thought that the impact of the change was significant. Accordingly, the loading for the endurance test set forth in the December rule is retained as previously published.

Loading for high speed test. The same three petitioners requested reconsideration of the changes in the loading for the high speed test. The standard requires that a tire must not exhibit any visible damage at the end of the test. Prior to the high speed test, the tire must be conditioned by being run at 50 miles per hour (mph) for two hours. Following this conditioning period, the tire is run for ½ hour at 75 mph, ½ hour at 80 mph, and ½ hour at 85 mph, for a total of 220 miles. The load used during the testing was shown in a particular inflation pressure column in Table I. The load averaged 85 percent of maximum load for alphanumeric tires, between 85 and 86 percent of maximum load for European radial tires, and 87 percent for the domestic P-metric radial tires. The new loading schedule for the high speed test specifies that the tires be loaded with 88 percent of the tire's maximum load. Hence, the new schedule would increase the load on the tire during this test by anywhere from one to three percent of the maximum load, depending on the type of tire.

The notice of proposed rulemaking to delete Table I (45 F.R. 57466; August 28, 1980) proposed that the load for the high speed test be 85 percent of the maximum load labeled on the sidewall of the tire. However, Chrysler, Ford, and General Motors all urged that this be increased to 88 percent in the final rule (the same level used in Standard No. 119 for tires other than passenger car tires) since the 85 percent figure would require them to use larger tires on a few of their models. The change to the 88 percent figure was made in the final rule.

RMA stated in its petition for reconsideration that the increase to 88 percent of maximum load was "significant and apparently inadvertent." RMA went on to say that while the agency had amended the proposal so as not to force unnecessary increases in tire sizes currently used, it might now be permitting unnecessary decreases in the tire sizes used. Goodyear and Cooper both also argued that this increase in loading could result in the downsizing of tires.

The agency believes that its adoption of 88 percent of a tire's maximum load as the test condition for the high speed test was appropriate and did not make a significant change to Standard No. 109. Eighty-eight percent is the same level which has been used as the load for the high speed test for all tires for use on motor vehicles other than passenger cars since Standard No. 119 became effective. The experience with the testing under that Standard has not shown this loading to be high.

Aside from the fact that this is the same level of loading used for the high speed test for all other tires, it is appropriate that a tire be able to carry a high percentage of its maximum load. Indeed, a properly inflated tire should be able to carry 100 percent of its maximum load on the road. The very definition of the term "maximum load" implies such a capability.

However, for the high speed test, it is necessary to use a figure of less than 100 percent in order to account for the differences between actual on-road conditions and the laboratory test conditions and for the extreme stress to which the tire is subjected. Accordingly, a correction factor of 12 percent of the maximum load was included in the December final rule, which specified that the tire would be tested at 88 percent of its maximum load. This correction factor is admittedly less than the previous specified 13 to 15 percent. But the 12 percent correction factor has been used for testing tires under Standard 119 for seven years, and all experience shows that correction factor is sufficient to achieve its intended purpose. Absent data demonstrating the contrary, NHTSA can see no reason why this correction factor would not be adequate in Standard No. 109.

As to the significance of the load change, Cooper was the only one of the three petitioners which offered any data on that issue. In an attempt to support its argument, Cooper selected four of its largest alphanumeric tire sizes, and subjected them to an extended version of the high speed test until the tires failed. To run an extended test on a tire, the tester does not stop testing the tire after the 85 mph phase. Instead, he increases the test speed to 90 mph and continues to increase the test speed by 5 mph every ½ hour until the tire fails. Cooper's tests were done first at 85 percent of maximum load (the level formerly specified for these tires) for one set of tires of all four sizes and then at 88 percent of maximum load for another set of tires. Cooper's tests showed that, on average, its tires loaded at 85 percent failed at 367 miles shortly after beginnig the 105 mph phase of the extended test. Its tires loaded at 88 percent failed at 332 miles, after completing slightly over half of the 100 mph phase. Thus, the increased load caused a decrease of 35 miles or 9.5 percent. Cooper asserted that these results showed that the increase would shorten tire life on the road and therefore was a significant change to Standard No. 109.

NHTSA does not believe that Cooper's tests support either of its assertions. The high speed test is designed only to measure the ability of the cord body of the tire to retain the tread during sustained high speeds and the resulting high temperatures. NHTSA is unaware of any data even suggesting a positive correlation between miles accumulated before failure on an extended high speed test and predicted service life of a tire. The extended high speed test would be useful in determining the suitability of tires for use on a police pursuit car or a racing car, but, even for those vehicles, the mileage accumulated before failure would not be a valid predictor of service life in miles of the tires.

Moreover, NHTSA beleives that Cooper's data actually supports the agency's belief that the change in the loading conditions for the high speed test was insignificant. These data show that the tires passed the high speed test under both test loads by wide margins. In the extended high speed tests, Cooper's tires ran on average slightly over half of the 100 mph phase of the test under the 88 percent load before failing, while those under an 85 percent load failed shortly after entering the 105 mph phase of the test. In either case, the tires not only successfully completed the 85 mph phase, but also exceeded the high speed requirement of Standard 109 by a wide margin. Further, none of the tires were the sort that would be chosen for occasional high speed operations. These data reinforce the agency's expressed belief that the slight increase in stringency for the high speed test is an insignificant increase which will not alter the results of any tests under the standard or require any redesign by tire manufacturers.

Goodyear and Cooper further asserted that the increase in the high speed test loading would allow the car manufacturers to substitute smaller tire sizes than those currently used on new cars. Such substitution could theoretically occur because section S4.2 of Standard No. 110 requires that the normal vehicle load on the tires not exceed the loading used for the high speed test in Standard No. 109. If, for example, the test load of a particular tire type was previously 86 percent of the maximum load rating and is now increased to 88 percent, the 2 percent increase in permissible normal vehicle load might permit the use of the next smallest size of that type of tire on a vehicle. However, none of the petitioners identified which models they believed could be shifted to smaller tires.

To test the petitioners' assertion, NHTSA checked the tires used on automobiles produced by U.S. manufacturers for the 1982 model year. All of these cars offered P-metric tires as standard equipment. As noted above, P-metric tires were formerly tested at an average 87 percent of their maximum load. The one percent increase in load allowed by the December rule will not allow any substitution of a smaller tire size on any of these cars.

All of the 1982 passenger cars offered by the Japanese and European manufacturers use European metric radials as standard equipment. These tires previously were tested at an average of between 85 and 86 percent of maximum load, so it is theoretically possible in isolated cases that the increase would permit the use of smaller tires. However, a survey by the agency of all 1982 models did not reveal any instances in which smaller tire size could in fact be substituted on the cars.

The type of tire for which substitution would most likely be feasible is the alphanumeric tires, formerly tested at 85 percent of their maximum load. This type of tire is no longer offered as standard equipment on any new passenger car. Based on the trend towards the use of radial tires, the alphanumeric tire is very unlikely to be offered as standard equipment on any future new cars. The agency's examination of the possibility of substitutions involving these three types of tires did not reveal any instances where the substitution of smaller tires would be an actual possibility.

Even if there were one or two foreign vehicles on which smaller tire sizes could be and are used, the agency does not believe that that fact would be significant. All new cars must comply with the requirements of section S4.2 of Standard No. 110. This section states that the maximum vehicle load on a tire must not exceed the tire's maximum load, as labeled on its sidewall, and that the normal vehicle load must not exceed 88 percent of that maximum load. Tires and vehicles complying with these requirements would not, in this agency's judgment, present any increased safety hazards over vehicles and tires where the vehicle normal load did not exceed 85 percent of the maximum load. It would be inappropriate for this agency to prohibit the use of smaller tire sizes in situations where the smaller sizes can be used without compromising the safety of the finished automobile.

After considering the above arguments, NHTSA has determined that none of the arguments show that 88 percent figure adopted in the December rule was inappropriate to use for high speed testing or that the increase in loading was a significant change to the standard. Accordingly, the agency is retaining the 88 percent figure.

However, NHTSA is in the process of issuing a proposal which may result in changing the load for high speed testing. The proposal seeks comments on alternative ways of changing the loads used for high speed testing under Standard No. 109 and for the temperature resistance tests used under the Uniform Tire Quality Grading Standards (UTQGS) so that they are the same. Prior to the deletion of Table I from Standard No. 109, the loads used for the two regulations were identical. As a result of changes to Standard No. 109 and UTQGS necessitated by the deletion of Table I, that is no longer true. (See the December 1981 final rule and the interim final rule issued at 47 F.R. 25930; June 15, 1982.)

Public notice of new tire sizes or tire/rim concepts. RMA argued that it was essential that there be advance public notice of new tire sizes or new tire/rim concepts. Cooper agreed with RMS on this point. It stated that a smaller tire manufacturer such as itself would not learn in advance of new tire size designations since it does not belong to any foreign standardization organizations and does not have day-to-day contact with the vehicle manufacturers. Additionally, Cooper argued that advance notice would preclude dangerous intermix situations.

The agency does not believe that such formalized advance notice of the introduction of new tire sizes or new tire/rim concepts is necessary for any safety-related reason, as explained in the final rule on this subject. NHTSA does note that advance notice would be useful for competitive reasons. It would aid some manufacturers in learning about the introduction of new sizes and concepts and in producing similar tires of their own. If more manufacturers make a particular tire size, a consumer can expect the competition to produce lower retail prices of the tire size.

On the other hand, the tire tables themselves introduced anti-competitive elements to the market, and may have served as an impediment to market entry.

The NHTSA does not believe publishing notices about new tire sizes and concepts is a necessary or proper function for a safety agency, or that such a mechanism is appropriate for requirement in a safety standard. It appears to be a fairly simply matter for any manufacturer to keep abreast of the activities of foreign standardization organizations either through membership in a standardization organization or on their own. Nevertheless, the agency will consider publishing notice of new tire concepts and sizes when information about them is received from individual manufacturers if those concepts and sizes have not already been publicized as a result of being coordinated with a standardization body. The process of providing such notice would simply inform all interested persons about the introduction. It would not provide any opportunity for those persons to file submissions which would have the effect of delaying the introduction of the new sizes or concepts.

Effective date. The changes made by this notice simply correct an oversight by the agency and change the reference to be used in certain tire tests from maximum load data furnished by a manufacturer or a standardization organization to the maximum load labeled on the tire sidewall. None of these changes specify different test procedures or additional requirements, nor do they require any leadtime for preparation by tire or vehicle manufacturers. Failure to make these changes effective on the date of publication could give rise to a situation described by Michelin, where a tire size which meets all existing safety requirements could not legally be sold until a maximum load rating for that size was published by a standardization organization. Since no additional leadtime is needed to adjust to these changes and since failure to make these changes effective at publication could result in needless delays in the introduction of new tire sizes, NHTSA has determined that good cause exists for making these changes effective upon publication.

Analyses or regulatory impacts. NHTSA has analyzed the impacts of this action and determined that it is neither "major" within the meaning of Executive Order 12291 nor "significant" within the meaning of the Department of Transportation regulatory policies and procedures. These revisions will avert a situation where new tire sizes meeting all existing safety requirements could have their introduction delayed, and simplify the determination of appropriate test conditions. If these revisions have any effect on costs, that effect should be a minimal cost savings. The agency does not believe that these amendments would have any effect on the price of new tires. Innovative tire manufacturers and consumers might benefit from a slightly earlier introduction of new tire technology. Again, this impact would be very minimal. Accordingly, a full regulatory evaluation has not been conducted.

Issued on August 12, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 36180
August 19, 1982

TABLE I—MINIMUM BREAKING ENERGY VALUES (INCH-POUNDS)

TABLE I—A—FOR BIAS PLY TIRES WITH DESIGNATED SECTION WIDTH 6 INCHES AND ABOVE

	Maximum Permissible Inflation Pressure					
Cord Material	*32 lb/in^2*	*36 lb/in^2*	*40 lb/in^2*	*240 kPa*	*280 kPa*	*300 kPa*
Rayon	1650 in.-lbs.	2475 in.-lbs.	3300 in.-lbs.	1650 in.-lbs.	3300 in.-lbs.	1,650 in.-lbs.
Nylon or Polyester	2600 in.-lbs.	3900 in.-lbs.	5200 in.-lbs.	2600 in.-lbs.	5200 in.-lbs.	2,600 in.-lbs.

TABLE I—B—FOR BIAS PLY TIRES WITH DESIGNATED SECTION WIDTH BELOW 6 INCHES

	Maximum Permissible Inflation Pressure					
Cord Material	*32 lb/in^2*	*36 lb/in^2*	*40 lb/in^2*	*240 kPa*	*280 kPa*	*300 kPa*
Rayon	1000 in.-lbs.	1875 in.-lbs.	2500 in.-lbs.	1000 in.-lbs.	2500 in.-lbs.	1,000 in.-lbs.
Nylon or Polyester	1950 in.-lbs.	2925 in.-lbs.	3900 in.-lbs.	1950 in.-lbs.	3900 in.-lbs.	1,950 in.-lbs.

TABLE I—C—FOR RADIAL PLY TIRES

	Maximum Permissible Inflation Pressure					
Size Designation	*32 lb/in^2*	*36 lb/in^2*	*40 lb/in^2*	*240 kPa*	*280 kPa*	*300 kPa*
Below 160 Millimeters	1950 in.-lbs.	2925 in.-lbs.	3900 in.-lbs.	1950 in.-lbs.	3900 in.-lbs.	1,950 in.-lbs.
160 Millimeters or above	2600 in.-lbs.	3900 in.-lbs.	5200 in.-lbs.	2600 in.-lbs.	5200 in.-lbs.	2,600 in.-lbs.

TABLE I—D—[FOR TIRES WITH 60 LB./IN^2 MAXIMUM PERMISSIBLE INFLATION PRESSURE AND MAXIMUM LOAD RATING OF 880 POUNDS AND ABOVE]

Cord Material	*Inch-Pounds*
Rayon	1650
Nylon or Polyester	2600

[TABLE I—E—FOR TIRES WITH 60 LB./IN^2 MAXIMUM PERMISSIBLE INFLATION PRESSURE AND MAXIMUM LOAD RATING BELOW 880 pounds]

Cord Material	*Inch-Pounds*
Rayon	1000
Nylon or Polyester	1950

TABLE II—TEST INFLATION PRESSURES

Maximum Permissible Inflation Pressure	32 psi	36 psi	40 psi	60 psi	240 kPa	280 kPa	300 kPa
Pressure to be used in tests for physical dimensions, bead unseating, tire strength, and tire endurance	24 psi	28 psi	32 psi	52 psi	180 kPa	220 kPa	180 kPa
Pressure to be used in test for high-speed performance	30 psi	34 psi	38 psi	58 psi	220 kPa	260 kPa	220 kPa

PREAMBLE TO MOTOR SAFETY STANDARD NO. 110

Tire Selection and Rims—Passenger Cars

(Docket No. 18)

A proposal to amend § 371.21 of Part 371, Initial Federal Motor Vehicle Safety Standards, by adding Standard No. 109, New Pneumatic Tires—Passenger Cars; and Standard No. 110, Tire Selection and Rims—Passenger Cars; was published in the *Federal Register* on July 22, 1967 (32 F.R. 10812).

Interested persons have been afforded an opportunity to participate in the making of the amendment.

Compliance with the labeling requirements of Standard No. 109, established in accordance with section 201 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1421), and the tread wear indicator requirements found in the standard may necessitate the modification of tire molds. Several tire manufacturers requested that additional time be allowed to modify these tire molds. After evaluation of all data received, it was determined that an effective date of August 1, 1968, for paragraphs S4.2.1 and S4.3 would provide a reasonable amount of time to accomplish the necessary mold modifications.

Many comments stated that no practical way is known to permanently affix a label onto the tire sidewall, as would have been required by proposed paragraph S4.3.1 until such time as a label is molded into or onto the tire. Accordingly, S4.3.1 of Standard No. 109 has been modified to permit, until August 1, 1968, the use of a label or tag containing the required labeling information not permanently molded into or onto the tire.

Many comments objected to the limitations imposed by the maximum tire section width dimensions specified in the tables of the notice. The Administrator has determined that additional latitude is necessary, and therefore Standard No. 109 specifies that to provide for tire growth, protective side ribs, ornamentation, manufacturing tolerances, and design differences for each tire size designation actual tire section width and overall tire width may exceed the section width specified in Table I of the Standard by 7 percent.

In response to requests, additional tire size designations and load/inflation schedules were added when necessary information was available. In addition, Table I of Standard No. 109 and Table II of Standard No. 110 have been combined to collate related information.

Persons desiring an amendment to Standard No. 109 adding tires not presently listed, should submit sufficient pertinent information relative to these tires in 10 copies to the Secretary of Transportation; Attention: Motor Vehicle Safety Performance Service, National Highway Safety Bureau, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. 20591.

Data received have shown that the rim references indicated in the proposed Standards were inadequate in coverage. Therefore, a more comprehensive list of foreign and domestic trade association publications containing appropriate rim standards or practices has been referenced in the Standards.

Data received demonstrated that the bead unseating and tire strength requirements were inappropriate for certain groups of small tires. Accordingly, tires were regrouped and the test values revised to provide requirements for these small tires that are proportional to the requirements for other sizes of tires.

Although Standard No. 109 applies to tires for use on passenger cars manufactured after 1948, some of the tires covered by the Standard may also be used on earlier model vehicles.

The testing procedures set forth in the Standard, size designations, and related data are based upon existing standards or practices using information furnished by such organizations as the Society of Automotive Engineers, Federal Trade Commission, Tire and Rim Association, European Tire and Rim Technical Organization, Japanese Standards Association, Japan Automobile Tire Manufacturers Association, Rubber Manufacturers Association, Tyre Manufacturers Conference, Ltd., and the Society of Motor Manufacturers and Traders, Ltd.

To permit production of sufficient quantities of tires complying with the requirements of Standard No. 109 after its effective date of January 1, 1968, Standard No. 110 applies to passenger cars manufactured on or after April 1, 1968.

A single table of load/pressure values for radial ply tires was included in the notice and this was supported by many comments. Other comments stressed the importance of including different load/pressure values for optimum tire deflections. Although a single table of load/pressure schedules combining these values for these radial ply tires would be desirable, it was not considered advisable to include such a table in the standard promulgated under the present notice.

In accordance with section 201 of the Act, S4.3 of Standard No. 109 requires that each tire be labeled with the name of the manufacturer or his brand name and an approved code mark to permit the tire seller to identify the tire manufacturer upon the purchaser's request. Any tire manufacturer desiring an approved code mark should apply for his code number assignment to the Secretary of Transportation; Attention: Motor Vehicle Safety Performance Service, National Highway Safety Bureau, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C. 20591.

Several comments, including the suggested use of a "load range" system, will be considered for future rule-making. (See 32 F.R. 14279).

Since it was clearly the intent of the Congress that, to enhance the safety of the general public, Federal Motor Vehicle Safety Standards for tires become effective as soon as practicable, and since no adverse comments were received pertinent to the proposed effective date presented in the advance notice of proposed rulemaking (32 F.R. 2417), at a Government-industry technical meeting, and in the notice of proposed rulemaking (32 F.R. 10812), and no undue burden was demonstrated, good cause is shown that an effective date earlier than 180 days after issuance is in the public interest.

In consideration of the foregoing, § 371.21 of Part 371, Initial Federal Motor Vehicle Safety Standards, is amended . . . Standard No. 109 becomes effective January 1, 1968, and Standard No. 110 becomes effective April 1, 1968.

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of Mar. 31, 1967 (32 F.R. 5606), as amended Apr. 6, 1967 (32 F.R. 6495), July 27, 1967 (32 F.R. 11276), Oct. 11, 1967 (32 F.R. 14277), November 8, 1967).

Issued in Washington, D.C., on November 8, 1967.

Lowell K. Bridwell,
Federal Highway Administrator

32 F.R. 15792
November 16, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 110

Tire Selection and Rims—Passenger Cars

(Docket No. 18R)

Motor Vehicle Safety Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938), specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance, and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires for use on passenger cars manufactured after 1948. Motor Vehicle Safety Standard No. 110 (32 F.R. 15798) specifies tire selection and rims requirements to prevent tire overloading.

Figures 2 and 3 of Standard No. 109 are drawings of the bead unseating test fixture used in performing the test specified in S5.2.

Section S5.4.2.3 specifies the 50 miles-per-hour test schedules for the tire endurance test.

Tables I–A through I–H list the various tire types and sizes with proper load and inflation values.

After review of Petitions for Reconsideration received under Docket No. 18R, the Administrator has determined that certain parts of Standard No. 109 require clarification, the tire tables need revision to include a number of new sizes and there is need for a table listing a new series of tires.

In addition, Standard No. 110 requires an additional table to list alternative rims for tire and rim combinations not presently covered by the standard.

Therefore, Standard No. 109 is being amended by—

(a) Revising Figures 2 and 3, which depict the bead unseating test fixture, by adding one additional dimension to Figure 2 and a center line and tangent line to Figure 3;

(b) Specifying that the test required by S5.4.2.3 be conducted without pressure adjustment or other interruption;

(c) In table I–A through I–H

(1) Adding additional tire size designations;

(2) Adding footnotes permitting the use of the letter "H", "S", or "V";

(3) Correcting typographical errors;

(d) Adding Table I–J which lists a new series of low section height tires.

In addition, Standard No. 110 is being amended by—

(a) Revising paragraph S4.4.1 to include alternative rims, not presently listed in the references cited in the definition of Test Rim in S3 of Standard No. 109; and

(b) Adding a new table of approved alternative rims.

Since these amendments provide clarification and alternative means of compliance, relieve restrictions, and impose no additional burden on any person, notice and public procedure hereon are unnecessary. The Administrator finds, for good cause shown, that no preparatory period is needed to effect compliance and it is therefore in the public interest to make the amendments effective immediately.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938), and Standard No. 110 (32 F.R. 15798), are amended, effective April 11, 1968. . . .

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of March 31, 1967 (32 F.R. 5606), as amended Nov. 8, 1967 (32 F.R. 15710)).

Issued in Washington, D.C., on April 11, 1968.

Lowell K. Bridwell,
Federal Highway Administrator.

**33 F.R. 5944
April 18, 1968**

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 110

Tire Selection and Rims—Passenger Cars
(Docket No. 18)

On September 11, 1968, the Federal Highway Administration published in the *Federal Register* amendments to Standard Nos. 109 and 110 (33 F.R. 12842). Omitted from publication as part of Appendix A of Standard No. 109 were Tables 1–A through 1–J. For the convenience of persons using the tables the preamble to the amendments published September 11, 1968, and the text of the amendments, as corrected by the addition of the omitted tables are published below. Additionally, Appendix A of Standard No. 110 has been changed to specify the information that should be submitted with requests for the addition of alternative rim sizes.

Federal Motor Vehicle Safety Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938 and 33 F.R. 5944), specifies tire dimensions and laboratory test requirements for bead unseating resistance, strength, endurance and high speed performance; defines tire load ratings; and specifies labeling requirements for new pneumatic tires for use on passenger cars manufactured after 1948. Motor Vehicle Safety Standard No. 110 (32 F.R. 15798) as amended (33 F.R. 5949) specifies tire selection and rim requirements to prevent tire overloading.

Tables 1–A through 1–J of Standard No. 109 list various tire types and sizes with proper load and inflation values.

Standard No. 109 is being amended to designate Tables 1–A through 1–J as Appendix A of Standard No. 109.

In addition, Table 1–H is being amended by adding additional tire size designations.

Table I of Standard No. 110, is a list of alternative rims for tire and rim combinations that are not contained in any reference in § 3 of Standard No. 109.

Standard No. 110 is being amended to designate Table I as Appendix A of Standard No. 110.

In addition, the table is being amended by adding, as alternative rims for tire size 8.55 x 15, rim sizes 5½–JK, 5½–JJ and 5½–J; F70–14, rim size 7JJ; and G70–14, rim size 7JJ.

Additionally, guidelines by which persons requesting routine additions to Appendix A of Standard No. 109 and Appendix A of Standard No. 110, are set forth as introductory language to both appendices. The guidelines provide an abbreviated rulemaking procedure for adding tire sizes to Standard No. 109, whereby the addition becomes effective 30 days from date of publication in the *Federal Register* if no comments are received. If comments objecting to the amendment warrant, the Administration will provide for additional rulemaking pursuant to the Rule Making Procedures for Motor Vehicles Safety Standards (23 C.F.R. 216).

Since these amendments provide an alternative means of compliance, relieve restrictions, and impose no additional burdens on any person, notice and public procedure hereon are unnecessary and the Administrator finds, for good cause shown, that no preparatory period is needed to effect compliance and it is in the public interest to make the amendments effective immediately.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standards, Standard No. 109 (32 F.R. 15792), as amended (32 F.R. 17938 and 33 F.R. 5944), and Standard No. 110, (32 F.R. 15798), as amended (33 F.R. 5949), are amended effective this date as set forth below.

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation from the Secretary of Transportation, Part I of the Regulations of the Office of the Secretary (49 C.F.R. § 1.4(c)).

Issued in Washington, D.C. on September 27, 1968.

John R. Jamieson, Deputy
Federal Highway Administrator

33 F.R. 14964
October 5, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 110

Tire Selection and Rims

(Docket No. 74–25; Notice 2)

This notice amends the definition of "test rim" in 49 CFR 571.109 (Motor Vehicle Safety Standard No. 109) and modifies related provisions of that section and section 571.110 (Motor Vehicle Safety Standard No. 110). A conforming amendment is made to similar provisions in section 571.119 (Motor Vehicle Safety Standard No. 119). The notice of proposed rulemaking on which this amendment is based was published on July 10, 1974 (39 F.R. 25329).

The definition of "test rim" has previous to this amendment referenced the 1967 and earlier editions of publications of various foreign and domestic tire and rim associations as the source for determining rim specifications and appropriate tire/rim matching information for testing tires to the requirements of Motor Vehicle Safety Standard No. 109, and for equipping passenger cars pursuant to Motor Vehicle Safety Standard No. 110. The Rubber Manufacturers' Association petitioned that this reference be changed because the publications have become outdated in terms of the rim information they provide. This amendment, which adopts the proposed rule of July 10, 1974, in essentially the form proposed, deletes the references to the 1967 and earlier publications and substitutes for them the publications of the various associations current at the time of tire manufacture.

Under the amendment, a "test rim" will be any rim listed for use with a tire size designation in any of the current publications of the various foreign and domestic tire and rim associations. The listing will apply to all tires that fit the description (by tire size designation, use category, etc.) unless the publication itself or a separately published manufacturer's document states otherwise. A manufacturer wishing to except any tire manufactured by him from any listing would be expected to request the association to publish the exception in its publication. If it does not, the manufacturer must himself publish the exception in his own listing, which he must distribute to his dealers, this agency, and to any member of the public on request. The language of the proposal is clarified, and a conforming amendment made to Standard No. 119 to show that an exception must be published in each association publication listing the tire and rim combination. The amendment further specifies that a "listing" of a rim must contain dimensional specifications, including diagrams, for the rim. This is necessary to provide for uniformity of rim dimensions and reflects the present practice of association publications of publishing such dimensional specifications. However, dimensional specifications or a diagram of a rim need not be included in manufacturers' separate listings if the specifications and diagram for the rim appear in each association publication where it is listed.

By referencing the current publications, the amendment ends the need for Appendix "A" of Standard No. 110, which lists tire/rim combinations approved for use subsequent to the 1967 and earlier associations publications. The associations and various manufacturers should ascertain that all tire/rim combinations presently listed in that Appendix are incorporated into at least one of their respective publications before the effective date of this amendment. Moreover, the addition of new tire/rim combinations subsequent to the effective date becomes the sole responsibility of the industry. Appendix "A" of Standard No. 109, listing tire size designations, is not affected by this amendment.

An effect of the amended definition of test rim is to clarify this agency's position that each tire must be able to pass each performance requirement (except that for physical dimensions) of Standard No. 109 with any rim with which it is listed, regardless of rim width, unless that tire is specifically excepted from each listing where it appears. The requirements for physical dimensions must be met only on a test rim of the width specified for the tire size designation in Standard No. 109. A tire failing the requirements on any test rim would be considered as having failed the requirements on all test rims. This continues existing NHTSA enforcement policy.

One of the two comments received regarding the proposal objected to this aspect of the amendment, arguing that some manufacturers have traditionally certified conformity on the basis of test results using only the test rims of the specified test rim width and that no safety problems had been encountered. The NHTSA believes, however, that the interest of safety demands that manufacturers ensure that tires certified as conforming to Standard No. 109 will conform to the standard's requirements on any rim which the manufacturer lists for use with the tire and with which the tire may consequently be used in service. This position has been reflected in the guidelines for the additions of new tire/rim combinations to the Appendix of Standard No. 110, which have required that the manufacturer demonstrate conformity to Standard No. 109 on each newly requested rim. If a manufacturer doubts the ability of his tires to conform to the standard on certain recommended rims, he has the option of excepting his tires from being used with those rims. No other objections to the proposed rule were received.

In light of the above, amendments are made to 49 CFR §§ 571.109, 571.110, and 571.119 . . . .

Effective date: August 5, 1975 for Standard No. 109 and 110; March 1, 1975, for Standard No. 119. The amendment to Standard No. 119 is of a clarifying nature, and should be made effective with the existing effective date of that standard. The amendment does not require substantial leadtime for conformity, and it is found for good cause shown that an effective date less than 180 days from publication is in the public interest.

(Secs. 103, 119, 201, 202, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. §§ 1392, 1407, 1421, 1422; delegation of authority at 49 CFR 1.51.)

Issued on January 31, 1975.

James B. Gregory
Administrator

40 F.R. 5529
February 6, 1975

MOTOR VEHICLE SAFETY STANDARD NO. 110

Tire Selection and Rims—Passenger Cars

S1. Purpose and scope. This standard specifies requirements for tire selection to prevent tire overloading.

S2. Application. This standard applies to passenger cars.

S3. Definitions.

"Accessory weight" means the combined weight (in excess of those standard items which may be replaced) of automatic transmission, power steering, power brakes, power windows, power seats, radio, and heater, to the extent that these items are available as factory-installed equipment (whether installed or not).

"Curb weight" means the weight of a motor vehicle with standard equipment including the maximum capacity of fuel, oil, and coolant, and, if so equipped, air conditioning and additional weight optional engine.

"Maximum loaded vehicle weight" means the sum of—

(a) Curb weight;

(b) Accessory weight;

(c) Vehicle capacity weight; and

(d) Production options weight.

"Normal occupant weight" means 150 pounds times the number of occupants specified in the second column of Table I.

"Occupant distribution" means distribution of occupants in a vehicle as specified in the third column of Table I.

"Production options weight" means the combined weight of those installed regular production options weighing over 5 pounds in excess of those standard items which they replace, not previously considered in curb weight or accessory weight, including heavy duty brakes, ride levelers, roof rack, heavy duty battery, and special trim.

"Vehicle capacity weight" means the rated cargo and luggage load plus 150 pounds times the vehicle's designated seating capacity.

"Vehicle maximum load on the tire" means that load on an individual tire that is determined by distributing to each axle its share of the maximum loaded vehicle weight and dividing by two.

"Vehicle normal load on the tire" means that load on an individual tire that is determined by distributing to each axle its share of the curb weight, accessory weight, and normal occupant weight (distributed in accordance with Table I) and dividing by two.

S4. Requirements.

S4.1 General. Passenger Cars shall be equipped with tires that meet the requirements of Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires—Passenger Cars."

S4.2 Tire load limits.

S4.2.1 [The vehicle maximum load on the tire shall not be greater than the applicable maximum load rating specified in one of the publications described in S4.4.1(b) of Motor Vehicle Safety Standard No. 109 for the tire's size designation and type. (46 F.R. 61473. Effective: 6/16/82)]

TABLE I

Occupant Loading and Distribution for Vehicle Normal Load for Various Designated Seating Capacities

Designated Seating Capacity, Number Occupants	*Vehicle Normal Load, Number of Occupants*	*Occupant Distribution in a Normally-Loaded Vehicle*
2 thru 4	2	2 in front
5 thru 10	3	2 in front 1 in second seat

S4.2.2 The vehicle normal load on the tire shall not be greater than the test load used in the high speed performance test specified in S5.5 of Motor Vehicle Safety Standard No. 109 for that tire.

S4.3 Placard. A placard, permanently affixed to the glove compartment door or an equally accessible location, shall display the—

(a) Vehicle capacity weight;

(b) Designated seating capacity (expressed in terms of total number of occupants and in terms of occupants for each seat location);

(c) [The tire rating specified in one of the publications described in S4.4.1(b) Motor Vehicle Safety Standard No. 109 for the tire size at that inflation pressure is not less than the vehicle load on the tire for that vehicle loading condition. (46 F.R. 61473. Effective: 6/16/82)]

(d) Vehicle manufacturer's recommended tire size designation.

S4.3.1 No inflation pressure other than the maximum permissible inflation pressure may be specified unless—

(a) It is less than the maximum permissible inflation pressure;

(b) The vehicle loading condition for that pressure is specified; and

(c) The tire load rating from Table I of Motor Vehicle Safety Standard No. 109 for the tire at that pressure is not less than the vehicle load on the tire for that vehicle loading condition.

S4.4 Rims.

S4.4.1 Requirements. Each rim shall:

(a) Be constructed to the dimensions of a rim that is listed pursuant to the definition of "test rim" in paragraph S3. of § 571.109 (Standard No. 109) for use with the tire size designation with which the vehicle is equipped.

(b) In the event of rapid loss of inflation pressure with the vehicle traveling in a straight line at a speed of 60 miles per hour, retain the deflated tire until the vehicle can be stopped with a controlled braking application.

33 F.R. 14969
October 5, 1968

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors—Passenger Cars and Multipurpose Passenger Vehicles

(Docket No. 13)

Motor Vehicle Safety Standard No. 111 (32 F.R. 2413) specifies requirements for rearview mirrors for use in passenger cars, multipurpose passenger vehicles, and passenger car and multipurpose passenger car equipment.

Paragraph S2, entitled "Application" of Motor Vehicle Safety Standard No. 111 (32 F.R. 2413) requires that the application of the Standard be as follows: "This standard applies to passenger cars, multipurpose passenger vehicles, and passenger car and multipurpose passenger vehicle equipment."

Paragraph S3.2.1.2 entitled "Mounting" of Motor Vehicle Safety Standard No. 111 (32 F.R. 2413) requires that outside mirrors installed on passenger cars and multipurpose passenger vehicles be mounted as follows: "The mounting shall provide a stable support for the mirror and neither the mirror nor the mounting shall protrude further than the widest part of the vehicle body, except to the extent necessary to meet the requirements of S3.2.1.1."

The National Traffic Safety Agency has determined that the mirror mounting may exceed the width of the vehicle to the extent necessary to produce a field of view meeting or exceeding the requirements of paragraph S3.2.1.1 of Standard No. 111 and that it would not be practicable to extend the application of the standard to replacement parts for vehicles manufactured before the effective date of the standard. Therefore, the standard is being amended to apply to passenger cars and multipurpose passenger vehicles, and to permit a mirror to protrude further than the widest part of the vehicle body to the extent necessary to produce a field of view meeting or exceeding the field-of-view requirements of the standard.

This amendment is made under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C., secs. 1392, 1407) and becomes effective January 1, 1968.

Issued in Washington, D.C., on March 29, 1967.

Lowell K. Bridwell,
Acting Under Secretary of
Commerce for Transportation

33 F.R. 5498
April 4, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors

(Docket No. 74-20; Notice 2)

This notice amends Standard No. 111, *Rearview Mirrors* (49 CFR 571.111) to allow installation of truck-type mirror systems in multipurpose passenger vehicles and to extend the coverage of the standard to trucks and buses.

The NHTSA proposed in a notice published on May 1, 1974 (39 F.R. 15143) to amend Standard No. 111, to specify minimum requirements for mirror size, capability, and location which would be applicable to all trucks, buses, and motorcycles, and to establish an option which would allow multipurpose passenger vehicles to meet either the present passenger-car mirror requirements or to satisfy the requirements proposed in the notice for trucks and buses. Standard No. 111 currently applies only to passenger cars and multipurpose passenger vehicles, specifying the same rearview mirror requirements for each. The NHTSA has determined that a need exists to extend the standard's coverage to other vehicle types that presently lack uniform Federal regulation in order to ensure observance of minimum mirror performance levels essential to motor vehicle safety.

The NHTSA also proposed in the notice published May 1, 1974 to require that all mirrors required by the standard, except those specified for motorcycles, be designed to reflect an image of unit magnification, thereby limiting any deviation from unit magnification to normal production variations and not variations which are the result of design. To this end it was proposed that the term "substantially" be deleted where it modifies "unit magnification" in the text of Standard No. 111.

Interested persons were afforded an opportunity to submit comments on the proposal by July 1, 1974 and due consideration has been given to the 36 comments received.

Two commenters opposed deletion of the term "substantial" where it modifies "unit magnification" on the ground that only mirrors of precisely unit magnification will now be acceptable. This view is erroneous. The interpretation followed by the NHTSA—and proposed to be incorporated in Standard No. 111 in this issue of the Federal Register—is that deviations from unit magnification are acceptable under the standard as amended below provided that the deviations do not exceed normal manufacturing tolerances.

All comments generally agreed with the NHTSA proposal to extend a Federal rearview mirror standard to trucks, buses and motorcycles. However, several comments recommended mirrors of larger area than those required in the NHTSA proposal for trucks and buses, and suggested the use of convex mirrors in addition to unit magnification mirrors. Others recommended specific requirements for school buses and clarification of the proposed standard for motorcycles with regard to location and area of mirrors and use of convex mirrors. While the NHTSA considers that the proposed extension of the scope of Standard No. 111 to cover trucks and buses will promote efficient rearward visibility, it agrees with those who have urged further research regarding requirements for school buses and motorcycles. Consequently, Standard No. 111 is amended by this notice to extend the scope of its coverage to trucks and buses (including school buses). At the same time, however, the NHTSA is proposing in this issue of the Federal Register to amend Standard No. 111 to specify new rearview mirror requirements for motorcycles and further requirements for school buses.

The majority of comments favored the proposal that trucks, buses, and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less comply either with the present passenger car mirror requirements, or with new requirements specifying outside mirrors on both sides of the vehicle with not less than 19.5 in^2 of reflective surface. This option is intended to overcome difficulties caused by classifying trucks, buses, and multipurpose passenger vehicles into groups specifying one mirror system adequate to fulfill the safety needs of all.

In addition, several commenters felt that heavy commercial vehicles, such as truck tractors, moving vans, and dump trucks, needed outside mirrors larger than 50 in^2. The NHTSA has determined that the 50 in^2 mirror is adequate for buses and for smaller multipurpose passenger vehicles and trucks. However, for multipurpose passenger vehicles and trucks with a GVWR exceeding 25,000 pounds, a 75 in^2 mirror appears better to meet the safety need. Therefore, while this notice amends Standard No. 111 to require that multipurpose passenger vehicles, trucks, and buses with a GVWR of more than 10,000 pounds have outside mirrors of not less than 50 in^2 of reflective surface, the NHTSA is proposing in this issue of the Federal Register to amend Standard No. 111 to require mirrors of at least 75 in^2 of reflective surface on multipurpose passenger vehicles and trucks with a GVWR of 25,000 pounds or more.

Several persons contended with regard to multipurpose passenger vehicles, trucks, and buses that the provision requiring that mirrors be adjustable by "tilting in both the horizontal and vertical direction" did not take into account the methods used to mount mirrors on these types of vehicles. Large mirrors, such as the so-called "West Coast" mirror which affords approximately 96 square inches of reflective surface area, are commonly mounted on rigid brace assemblies. These mirrors can be adjusted to provide the driver a view to the rear. However, once they are locked into place they are not capable of "tilting in both the horizontal and vertical direction." While mirrors mounted on ball sockets are fully adjustable in the horizontal and vertical directions by tilting, the NHTSA finds no reason to preclude the use of a mirror that possesses full adjustment capability and is only locked into a position once it satisfies the particular driver's viewing needs.

The NHTSA has decided to delete the words "by tilting" from the requirements for multipurpose passenger vehicles, trucks, and buses. The rule requires that mirrors on such vehicles "shall be adjustable in both the horizontal and vertical directions to view the rearward scene."

In consideration of the foregoing, Motor Vehicle Safety Standard No. 111, 49 CFR 571.111, is amended. . . .

Effective date: February 12, 1976.

(Secs. 103, 119, Pub. L. 89563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on: August 6, 1975.

James B. Gregory
Administrator

40 F.R. 33825
August 12, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors

(Docket 74–20; Notice 4)

This notice responds to four petitions for reconsideration of the notice published August 12, 1975 (40 F.R. 33825) which amended Federal Motor Vehicle Safety Standard No. 111, *Rearview Mirrors* (49 CFR 571.111), to allow installation of truck-type mirror systems in multipurpose passenger vehicles and to extend coverage of the standard to trucks and buses.

Petitions for reconsideration were received from American Motors, Ford, General Motors, and the Motor Vehicle Manufacturers Association. They all asked the NHTSA to amend the standard to include a statement that the eye reference points to be used to determine compliance with the field of view requirements set forth in S4.1.1 and S4.2.1 may also be "at a nominal location appropriate for any 95th percentile driver." The NHTSA had determined by a previously published interpretation (32 F.R. 5498) that the standard in effect in April of 1967 permitted location of the driver's eye reference point in this manner. The recent amendments did not change this aspect of the standard. However, in order to resolve any doubt concerning the applicability of the prior interpretation, the agency proposed in a notice published August 12, 1975, to formally reaffirm this interpretation by amending the standard. Petitioners seek immediate adoption of this proposal. The NHTSA agrees that the standard may be amended at this time to incorporate the previous interpretation. Therefore, Federal Motor Vehicle Safety Standard No. 111, *Rearview Mirrors* (49 CFR 571.111), is amended. . . .

Effective date: February 19, 1976.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued February 12, 1976.

James B. Gregory
Administrator

41 F.R. 7510
February 19, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors

(Docket No. 74–20; Notice 5)

This notice amends Standard No. 111, *Rearview Mirrors*, to establish separate requirements for school buses, to increase the amount of reflective surface required for mirrors on multipurpose passenger vehicles and trucks with a GVWR of 25,000 pounds or more, and to extend the coverage of the standard to motorcycles.

By final rule published by the National Highway Traffic Safety Administration (NHTSA) on August 12, 1975 (40 F.R. 33825), Standard No. 111 (49 CFR 571.111) was amended to allow installation of truck-type mirror systems on multipurpose passenger vehicles and to extend the coverage of the standard to trucks and buses. As amended, the standard specified identical requirements for all types of buses. No distinction was made between commercial buses and school buses. No requirements were set out for motorcycles, as had been proposed in an earlier notice. Further, the standard imposed the same requirements for all multipurpose passenger vehicles, trucks, and buses with a GVWR of more than 10,000 pounds.

At the time of these changes, the NHTSA had completed further research and considered comments submitted by participants in that rulemaking, and determined that the promulgation of separate rearview miror requirements for motorcycles, school buses, and multipurpose passenger vehicles and trucks with a GVWR of 25,000 pounds or more would ensure the provision of minimum performance levels essential to motor vehicle safety. Therefore, a notice proposing these changes was also published on August 12, 1975 (40 F.R. 33828), and forms the basis of the present amendments.

Interested persons were afforded an opportunity to submit comments on the proposal by September 26, 1975, and due consideration has been given to the 24 comments received. The National Motor Vehicle Safety Advisory Council did not take a position on the proposed amendments. (Active dockets concerning rearview mirrors are Docket No. 74–20 and Docket No. 71–3a.)

Commenters generally agreed with the NHTSA proposal to establish rearview mirror requirements for motorcycles. However, the Grote Manufacturing Company oposed the optional use of convex mirrors, contending that their use on motorcycles would be hazardous due to the distortion of distance characteristics of convex mirrors and the unfamiliarity of young drivers with them. The NHTSA has decided that both plane and convex motorcycle mirrors should be permitted, since available data does not support the contention that convex mirrors would be hazardous. The SAE Recommended Practice J268(a), "Rear View Mirrors—Motorcycles," specifies criteria for both plane and convex mirrors, and convex mirrors are presently in common usage on motorcycles.

There were also recommendations for both larger and smaller minimum reflective area requirements for motorcycle mirrors, and one recommendation for field-of-view performance requirements instead of a reflective area requirement. The amendment specifies 12.5 in^2 of reflective surface for a plane motorcycle mirror or 10 in^2 of reflective surface for a convex mirror. The NHTSA concludes that these required reflective surface areas will ensure a safe level of rearview visibility on motorcycles. The NHTSA finds the larger reflective area is needed on the plane mirror to offset its smaller field-of-view compared to that of a convex mirror. It is contemplated that field-of-view performance requirements will be developed in future rulemaking.

The State of California commented that the SAE Recommended Practice J964a, specified in paragraph S11 of the standard, does not include a procedure for measuring the reflectance of convex mirrors, and suggested that a different procedure be specified. This suggestion is not well taken since, contrary to California's comment, the Recommended Practice does include a procedure for measuring convex mirror reflectance.

This amendment excepts school buses from the general bus requirements specified in paragraphs S6 and S7 of the standard, as amended by this notice, and establishes a new paragraph, S9, which requires school buses to be equipped with outside mirrors of unit magnification with not less than 50 in^2 of reflective surface and, except for forward control vehicles, with a convex cross-view mirror that has a minimum of 40 in^2 of reflective surface and an average radius of curvature not less than 12 inches and not greater than 25 inches.

The Grote Manufacturing Company contended that a 50 in^2 plane mirror on the right side of a school bus is inadequate, but the NHTSA believes that the 50 in^2 mirror in common use offers sufficient reflective area. Likewise, the NHTSA cannot agree with the views of the States of California and Illinois that a 40 in^2 cross-view mirrors is insufficient. Manufacturers can meet this requirement with the 7½ inch-diameter convex mirror which is commonly installed on school buses and which has been found to be adequate.

California also opposed the proposal that forward control school buses be excluded from the cross-view mirror requirements, stating that cross-view mirrors might be necessary on some forward control configurations. The NHTSA will consider this aspect of California's comment in future rulemaking in which the agency plans to develop field-of-view performance tests.

The State of Illinois, noting that the proposed amendments specified requirements for cross-view mirrors on school buses, recommended that the title of Standard No. 111, *Rearview Mirrors*, be shortened to "Mirrors." The NHTSA believes that such a change is unnecessary and might create confusion since the industry has come to associate the existing title with the standard number. Therefore, there is no change in the title of Standard No. 111 even though this amendment adds a provision for cross-view mirrors.

Several commenters, including Blue Bird Body Company, the State of Illinois, and the Grote Manufacturing Company, disagreed with the preamble discussion concerning preemption that appeared in the notice proposing this amendment (40 F.R. 33828), in regard to Federal versus State requirements for rearview mirrors on school buses. There appears to be some confusion concerning the provision of the National Traffic and Motor Vehicle Safety Act of 1966, P.L. 89–563 (15 U.S.C. § 1392(d)) that allows states and political subdivisions to impose higher standards of performance than is required by Federal standards in the case of vehicles procured for their own use. Blue Bird Body Company commented that the interpretation in the preamble to the proposal "would allow local governments and other parties to specify potentially conflicting requirements with all NHTSA standards." This is incorrect. Section 103(d) of the National Traffic and Motor Vehicle Safety Act provides that no State or political subdivision of a State shall have authority to establish a motor vehicle safety standard governing the same aspect of performance of a motor vehicle or of motor vehicle equipment as a Federal standard, unless it is identical to the Federal standard. The only exception, also provided in section 103(d) of the Act, is that a State may establish a safety requirement applicable to motor vehicles or motor vehicle equipment procured for its own use if such requirement imposes a higher standard of performance than the Federal standard. This means that a State may impose requirements additional to those specified in an applicable Federal standard only if the vehicles are procured specifically for use by the State or its political subdivision. Therefore, a State may not require vehicles manufactured or sold for use by private parties to meet any standards not identical with Federal standards, even if the State standard would require a higher level of performance. Use of the phrase "higher standard of performance" means that the State standard must not conflict with the Federal standard but may contain additional requirements.

The phrase does not mean that a State standard will be subjectively analyzed as a whole to determine its comparable worth in safety terms in relation to a Federal standard. Such an interpretation would create impracticable results. Finally, as stated in the preamble of the notice proposing these amendments, the National Traffic and Motor Vehicle Safety Act of 1966 does not prohibit a nongovernmental purchaser of a vehicle from contracting with a manufacturer or dealer for additional safety features beyond those required by Federal motor vehicle safety standards.

The majority of comments favored the proposal that multipurpose passenger vehicles and trucks with a GVWR of more than 10,000 and less than 25,000 pounds, and buses, other than school buses, with a GVWR of more than 10,000 pounds continue to be equipped with outside mirrors of unit magnification on both sides of the vehicle, each with not less than 50 in^2 of reflective surface.

The Teamsters Union recommended that the proposed 75-square-inch reflective area requirement for trucks and multipurpose vehicles with a GVWR of 25,000 pounds or more be increased to a 96-square-inch requirement. The NHTSA has carefully considered the views of the Teamsters, but must conclude, based on available studies, that the proposed 75-square-inch mirror is adequate for safety purposes. Further, a larger reflective area requirement would prohibit the new truck mirrors that are designed to be mounted below the driver's line of sight. Use of these mirrors is encouraged by the agency since they do not obstruct the forward view of the driver, as do the larger "West Coast" mirrors.

The obstruction of the forward view due to the mounting location of some of the larger mirrors can create a potential safety hazard, as pointed out by several commenters. However, rather than incorporating mounting location as a requirement of the standard at this time, the NHTSA believes the problem can better be solved through viewing performance requirements to be promulgated in the future.

The State of California suggested that minimum width requirements be specified for side-mounted mirrors, and that truck classification be based on a system other than GVWR. We see no need to specify width requirements. The California comments provided no evidence, and the agency has no indication, that manufacturers would circumvent the purposes of the standard by providing long and narrow side mirrors. No circumvention of this sort has occurred in the case of mirrors currently available on the market. The NHTSA recognizes that truck classification based on GVWR creates some artificiality in the applicability of requirements, but other methods of classification create similar problems. These problems can better be corrected in future rulemaking with the specification of field-of-view performance requirements.

Finally, several commenters recommended that combination plane and convex mirrors be required for large multipurpose passenger vehicles and trucks, in order to increase the field of view. The NHTSA agrees that the use of convex mirrors on larger vehicles would be of some benefit because of the increased field of view they would provide. Therefore, the agency publishes in this issue of the *Federal Register* a proposal to amend Standard No. 111 to specify the optional use of plane and convex mirror combinations on buses other than school buses, multipurpose passenger vehicles, and trucks that have a GVWR of 10,000 pounds or more.

This amendment also clarifies the deflection requirements for inside rearview mirror mountings on passenger cars. The amendment specifies that the mounting is required to "break away" when the test force is applied to the reflective surface of the mirror in any direction that forms an angle of up to 45° with the forward longitudinal direction. The amendment clarifies that the mounting is required to deflect, collapse, or "break away" when the force is applied to the reflective surface in a generally forward direction.

The provision of Standard No. 111 regarding mirror construction is amended to provide that the "average" reflectance value of the reflective film employed on any mirror required by the standard must be at least 35 percent. The purpose of this amendment is to make clear that the failure of any individual point or points on the reflective surface of a mirror to reflect 35 percent of a light source does not constitute a failure to comply with the standard if the average reflectance of the total points comprising the reflective surface is at least 35 percent.

The amendment incorporates into the mirror construction requirements the current test procedures for measurement of average reflectance value found in the Society of Automotive Engineers Recommended Practice J96a, August, 1974.

Standard No. 111 is further amended by this notice to add a definition of the term "mirror of unit magnification." This definition incorporates a previous NHTSA interpretation to the effect that precise "unit magnification" is not required by the standard if any deviations are not in excess of normal manufacturing tolerances. The definition provides that a prismatic day-night adjustment rearview mirror, one of whose positions provides unit magnification, is considered a unit magnification mirror.

The notice proposing these amendments (40 F.R. 33828) included a proposal that the term "driver's eye reference point" referred to in S5.1.1 and S5.2.1 of the standard as amended by this notice, be changed to "driver's eyes reference points" in order to more accurately describe the locations to which the term refers. The notice further proposed that the standard be amended to permit location of the driver's eye reference point at "a nominal location appropriate for any 95th percentile male driver," as had been established in a previously published NHTSA interpretation (32 F.R. 5498). At the time of the proposal, Standard No. 111 only provided that the location of the driver's eye reference point "shall be that established in Motor Vehicle Safety Standard No. 104." The proposal provided that the location of the eye reference point could be derived through either formula.

In response to four petitions for reconsideration, by final rule issued February 19, 1976 (41 F.R. 7510), Standard No. 111 was amended to partially adopt the proposed changes regarding driver's eye reference point. The standard was amended to incorporate the previous NHTSA interpretation which allowed location of the driver's eye reference point "at a nominal location appropriate for any 95th percentile adult male driver." The petitioners had requested that this aspect of the proposal be adopted immediately.

Today's amendment completes the adoption of the proposed changes by modifying the term "driver's eye reference point" to read "driver's eye reference points." As amended, the last sentence of S5.1.1 and S5.2.1 now reads: "The location of the driver's eye reference points shall be those established in Motor Vehicle Safety Standard No. 104 (§ 571.104) or a nominal location appropriate for any 95th percentile adult male driver." Even with these changes, however, there still appears to be much confusion concerning this aspect of the field-of-view performance requirements for passenger cars. General Motors has recommended that the reference to Standard No. 104 in paragraphs S5.1.1 and S5.2.1 be deleted, since that standard's designation of "eye reference points" is ambiguous. In light of the evident confusion, the NHTSA is proposing in this issue of the *Federal Register* to amend paragraphs S5.1.1 and S5.2.1 of Standard No. 111 to specify that location of driver's eye reference points shall be determined in accordance with the procedure found in SAE Recommended Practice J1050, "Describing the Driver's Field of View," Section 7 (September, 1973). References to Standard No. 104 and to the "nominal location" method of determining the eye reference points would be deleted from the standard.

These amendments should have only a minimal economic and environmental impact, since manufacturers are currently equipping vehicles with the same type mirrors that are required by the amendments.

In consideration of the foregoing, the amendments of Motor Vehicle Safety Standard No. 111 (49 CFR 571.111) are adopted without change. . . .

Effective date: February 26, 1977.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 17, 1976.

John W. Snow
Administrator

41 F.R. 36023
August 26, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors

(Docket No. 74-20; Notice 07)

This notice responds to petitions for reconsiderations of a recent amendment of Standard No. 111, *Rearview Mirrors*, by reducing upcoming mirror size requirements to the level presently specified by the standard.

By notice published August 26, 1976 (41 F.R. 36023), paragraph S8.1 of Standard No. 111 (49 CFR 571.111) was established to increase from 50 square inches to 75 square inches the amount of reflective surface required for plane mirrors on multipurpose passenger vehicles and trucks with a GVWR of 25,000 pounds or more. The new requirement becomes effective February 26, 1977. In the same issue of the *Federal Register* the NHTSA published a proposal to further amend Standard 111 to provide for the optional use of plane and convex mirror combinations on multipurpose passenger vehicles and trucks with a GVWR of 25,000 pounds or more (41 F.R. 36037). The proposed requirements would allow manufacturers to equip their larger vehicles with either a 75-square-inch mirror of unit magnification or a combination mirror system comprised of a 45-square-inch plane mirror and a 25-square-inch convex mirror.

Mr. M. W. Urban and the White Motor Company petitioned the NHTSA to revoke the amendment requiring vehicles over 25,000 pounds to have plane mirrors with 75 square inches of reflective surface. Petitioners were concerned that the proposal to allow plane and convex combinations for the larger vehicles would not be made a final rule by the time of the February 26, 1977, effective date for the 75-square-inch plane mirror requirement. They noted that this would have the effect of prohibiting the use of combination mirrors after February 26, 1977, although they are presently allowed and would be allowed again in the future under the outstanding proposal.

The NHTSA has determined that petitioners' argument has merit. As stated in the preamble to the August 26, 1976, proposal, the NHTSA recognizes that the larger vehicles (GVWR greater than 25,000 pounds) have rearward visibility problems that can create potential safety hazards, and that the use of both plane and convex mirrors on these vehicles should help to increase rearward visibility. The NHTSA does not wish to preclude the combination mirror systems currently being used on the MPV's and trucks, since most of these systems would meet dimensional specifications set forth in the outstanding proposal.

While the NHTSA concluded that the larger plane mirrors are necessary on heavy vehicles not equipped with combination mirrors, many manufacturers are already equipping these vehicles with "West Coast" mirrors that have 96 square inches of reflective surface. Therefore, postponement of the 75-square-inch plane mirror requirement for heavy vehicles should not significantly reduce motor vehicle safety.

The rearview mirror amendments published on August 26, 1976, established the requirement that school buses be equipped with plane mirrors having 50 square inches of reflective surface. Mr. Urban's petition for reconsideration also requested that this requirement be postponed and modified to include separate requirements for small school buses. The petition stated that smaller plane mirrors in combination with convex mirrors should be allowed on van-type school buses on an optional basis.

The NHTSA considered all comments to the notice proposing these school bus requirements prior to issuance of the final rule. It was determined that 50-square-inch plane mirrors were necessary on school buses to provide the driver an adequate view to the rear along both sides of the vehicle. Since Mr. Urban did not submit his views regarding van-type school buses during the specified comment period, his comments will only be considered in future rulemaking on this subject.

In consideration of the foregoing, the number "75 in^2" in paragraph S8.1 of Standard No. 111 (as published August 26, 1976 (41 F.R. 36023) and effective February 26, 1976) is amended to read "50 in^2."

Effective date: The change may be made immediately to the *Federal Register* text published August 26, 1976 (41 F.R. 36023) and is effective February 26, 1977.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on December 22, 1976.

John W. Snow
Administrator

41 F.R. 56813
December 30, 1976

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirror Systems

(Docket No. 71-3a; Notice 6)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Safety Standard No. 111 (rearview mirrors) by permitting the use of convex rearview mirrors on the exterior, passenger side of passenger cars and light trucks, to meet the field of view requirements when they are not met by the inside rearview mirror. Previously, only flat (plane) outside mirrors could be used to supplement an inside mirror which did not fully satisfy those requirements. This amendment is issued in response to a petition by General Motors. The agency believes that this amendment will result in improved driver rearward visibility, thereby reducing motor vehicle accidents and injuries.

EFFECTIVE DATE: September 2, 1982.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard ("FMVSS") No. 111 establishes requirements for the use, field of view, and mounting of motor vehicle rearview mirrors. With respect to passenger cars, the standard requires that manufacturers mount flat (sometimes referred to as "plane" or "unit magnification") mirrors both inside the vehicle and outside the vehicle on the driver's side. The inside mirror must, except as specified below, have a field of view at least 20 degrees wide and extending to the horizon beginning not more than 200 feet behind the vehicle. In cases where the interior mirror does not meet the specified field of view requirements, a plane, exterior mirror must be mounted on the passenger's side of the car. If a passenger side mirror is required to be used, it must be stably mounted, may not have sharp points or edges which could injure pedestrians, and must be adjustable. Reflectance (image brightness) criteria were also established. (If a manufacturer uses an interior mirror which meets the field of view requirements, and wishes to install an exterior passenger side mirror voluntarily, it may use any type of mirror for that purpose.)

In the case of light trucks, manufacturers may either comply with the passenger car requirement or have flat outside mirrors with reflective surface area of not less than 19.5 square inches on each side of the vehicle.

On May 26, 1976, General Motors Corporation (GM) petitioned the agency to amend FMVSS 111 to permit the use of convex mirrors on the passenger side of cars and light trucks, where the interior mirror did not meet the field of view requirements of the standard. GM pointed out in its petition that convex mirrors would provide a wider field of view than the flat mirrors of the same size. On August 26, 1976, the agency issued a notice of proposed rulemaking to amend the standard as requested by GM, but with certain limitations as to the characteristics of the convex mirrors which could be used. These limitations were considered necessary because some convex mirrors present a distorted image which could cause problems for some drivers.

The 1976 NPRM was incorporated in a proposal for a major upgrading of all the requirements in FMVSS 111. See F.R. 51657, November 6, 1978. Among the provisions of the 1978 proposal were requirements increasing the minimum field of view of the mirror system, more specific breakaway and shatter resistance requirements, and image luminance (another measure of image brigthness) criteria.

The 1978 NPRM also proposed to permit the use of convex outside mirrors which met certain additional requirements. The additional requirements, which were designed to reduce or eliminate problems certain drivers could experience when viewing images in convex mirror; included specifications of minimum and maximum radii of curvature, maximum variation of the radius of curvature for a given mirror, identification of convex mirrors (through the use of orange border) and discussions in owner's manuals for passenger cars and light trucks which use convex mirrors regarding the presence of the convex mirrors, the location of the mirrors, and the significance of the orange border.

The agency has determined that it is appropriate to take final action on the portions of the 1978 proposed rule relating to passenger side convex mirrors. The remaining provisions of the 1978 NPRM require further evaluation by the agency and will be addressed in a future notice. Therefore, the agency is amending FMVSS 111 to permit the use of convex mirrors on the passenger side of passenger cars (and also light trucks, since they may comply with FMVSS 111 by meeting the car requirements) subject to the following restrictions.

1) The radius of curvature of any convex mirror used shall not exceed 65 inches;

2) The radius of curvature of such a mirror may not be less than 35 inches;

3) The measured radius of curvature of a convex mirror, as specified in the agency's test procedure, may not vary by more than 12.5 percent from the mean radius of curvature;

4) Each convex mirror shall be readily identifiable by the following words etched on the lower portion of the glazing surface: "OBJECTS IN MIRROR ARE CLOSER THAN THEY APPEAR".

The need for each of these requirements, and the comments received on the proposed convex mirror requirements, are discussed below.

Comments on the NPRM. Several commenters questioned the desirability of permitting the use of convex mirrors on passenger cars and light trucks. Convex automotive mirrors exhibit a number of characteristics which differ from the common plane mirrors now in general use. One is that the image of an object viewed in a convex mirror is smaller than that of the same object viewed in a plane mirror. Therefore, such an object will appear to be farther away than it would when viewed in a plane automotive mirror. A driver who has always used plane mirrors might, when viewing a car to his or her rear in the immediately adjacent lane to the right (such as in a passing maneuver), perceive that that car is further to the rear than it actually is. In that situation, the driver might move to the right and change lanes before it is safe to do so. Some commenters believed that the combination of a plane and convex mirrors, and therefore differing image sizes, on the same car would add to the confusion. Other problems experienced by some users of convex mirrors include double vision, eyestrain, and nausea.

Research by the agency and by the mirror manufacturers indicate that these problems with convex mirrors can be greatly mitigated by certain restrictions and by steps to assure that drivers are aware that the mirror being used is not a standard plane mirror. Image distortion problems, for example, can be substantially reduced by regulating variation in the radius of curvature. The agency's NPRM specified that the radius of curvature of any portion of the mirror may not vary more than 12.5 percent from the mean radius of curvature for the entire mirror. To alert the driver that a convex mirror is being used, the agency is requiring both a statement in the vehicle owner's manual and a clear warning on the mirror itself.

The agency believes that, based on all available research, these safety criteria are necessary to reduce to within acceptable bounds any potential problems which drivers may experience with convex mirrors. In this regard, the agency has relied significantly upon a contract study performed by Vector Enterprises, Incorporated, for the agency, in which various convex mirrors meeting the specifications in the 1978 NPRM were evaluated. The passenger side convex mirror was found to be highly desirable in such maneuvers as moving to the right into an adjacent lane. The main safety benefit of such a system is that it provides an expanded field of view of the right, rear quadrant area adjacent to the vehicle, thus reducing the need of the driver to turn around to view that area directly. The study concluded that minimizing the total time a driver's attention is diverted from the forward area through the addition of a passenger side convex mirror should provide safety benefits. Another finding of that study was that drivers' abilities to use convex mirrors significantly improved with experience.

Several comments were also received on the minimum allowable radius of curvature for convex mirrors. Smaller radius of curvature mirrors provide a wider field of view but have smaller image sizes. The Vector study found that a radius range of 40 to 60 inches provided the best results, and the 1978 proposal specified a 40 inch minimum radius. Donnelly Mirrors stated that mirrors with about 10 percent smaller radii of curvature would still provide acceptable performance, based on several studies it cited. Therefore, in light of the agency's analysis of these studies, the agency is specifying a 35 inch minimum radius of curvature for convex mirrors.

The 1978 proposal also specified a 60 inch maximum radius of curvature for convex mirrors. Several commenters questioned the need for a maximum specification, since plane mirrors have always been permitted on the passenger side of cars and light trucks, and plane mirrors effectively have an infinite radius. Nevertheless, the agency feels that a maximum specification is necessary, to limit the range of convexities and therefore image minification to which drivers are exposed and to assure to the maximum extent possible that drivers are, whenever convex mirrors are used, aware due to image differences that the vehicle is equipped with such a mirror. Consistent with the available studies and to allow greater manufacturing flexibility, a 65 inch maximum radius is being established in this final rule.

The 1978 NPRM established a criterion of 12.5 percent for the maximum permissible variation in the radius of curvature over the surface of a convex mirror, and that criterion is being maintained in the final rule. Some commenters recommended reliance on the European criterion of 15 percent (using a different measuring device and excluding the areas of the mirror close to the edge). However, Donnelly Mirrors built a strong case in its comment on the 1978 NPRM for the need for a stringent distortion criterion. As Donnelly points out, low distortion mirrors reduce many of the problems drivers could experience with convex mirrors (double vision, nausea, dizziness). Further, they point out that mirrors of the quality level specified in the proposed standard are now available commercially at reasonable cost. Therefore, the agency cannot justify reducing that criterion. Variation in the radius of curvature would be measured by the procedure specified in the 1978 NPRM.

The proposed standard specified that convex mirrors must have an orange border to alert drivers that the mirror was not planar. The proposal also asked about other methods, including a written warning on the mirror, to accomplish this purpose. Chrysler Corporation recommended that the former approach not be used, since the orange border might be misinterpreted as being a styling feature and conveys no inherent, specific meaning. Rather, several vehicle and mirror manufacturers suggested that the words "OBJECTS IN MIRROR ARE CLOSER THAN THEY APPEAR" should be etched along the bottom edge of the mirror, to give a clear warning. Such a warning is common practice on current convex mirrors, in fact. One European mirror manufacturer suggested that the etched warning would be costly to apply and could impair the image viewed in the mirror. Some vehicle manufacturers suggested that the statement in the owner's manual would provide an adequate warning or that no warning at all was necessary.

Based on the previously discussed research, the agency remains convinced that a warning on the mirror itself is necessary. The fact that a convex mirror image appears different from that of a plane mirror does not, in the agency's view, provide an adequate warning that objects viewed in the convex mirror are closer than they appear. Further, the etched warning would serve as a reminder to the driver with each use and would assist drivers who had not read the owner's manual. Finally, the etched warning conveys a much clearer warning than the rather ambiguous orange border. With regard to the issue of image impairment, the agency's engineering judgment involving convex mirrors having this etched warning indicates that any such impairment caused by relatively small lettering on the bottom edge of the mirror surface is minimal. Further, the fact that such warnings are commonly used on current convex mirrors is a strong indication that the cost is not excessive. Therefore, the agency is requiring that convex mirrors used to comply with FMVSS 111 must have the words mentioned above etched on the bottom edge of the mirror surface in letters 3/16 to 1/4 inch high.

Rolls Royce argued that the agency should not limit the permitted convex mirror surface configurations to spherical surfaces, since spherical mirrors exhibit spherical aberration. Spherical mirrors (which are designed to have a single radius of curvature over the entire mirror surface) are typically used for automotive applications since the more optically correct parabolic mirror surfaces would be prohibitviely expensive to manufacture. However, should a manufacturer desire to offer a parabolic convex mirror and demonstrate that the mirror's surface configuration has a degree of accuracy equivalent to that specified in the standard for spherical surfaces, the agency would initiate rulemaking to permit the use of the parabolic mirror.

It should be emphasized that these requirements for convex mirrors do not apply to after-market mirrors or to convex mirrors which are not required to meet the field of view requirements specified in FMVSS 111. However, the agency strongly encourages vehicle and mirror manufacturers to consider using and designing mirrors to comply with the requirements of this standard even where not strictly required by the standard. The agency will continue to study the safety benefits of various rearview mirror systems and may establish requirements applicable to additional mirrors in future rulemaking.

The agency is making this amendment effective immediately upon publication, since the amendment "relieves a restriction" within the meaning of 5 U.S.C. 553(d)(1), by permitting the use of convex mirrors where they were previously unauthorized. The agency also finds that making this amendment effective immediately is in the public interest, in accordance with section 103(c) of the National Traffic and Motor Vehicle Safety Act, since doing so will permit the use of mirrors which provide wider fields of view for the 1983 model year. Also, since the amendment relieves a restriction in FMVSS 111, providing 180 days lead time is unnecessary.

NHTSA has determined that this proceeding does not involve a "major rule" within the meaning of section 1, paragraph (b), of Executive Order 12291 because it is not likely to have an effect on the economy of $100 million or more, to result in a major increase in costs or prices, or to have a significant adverse effect on competition, employment, investment, productivity, innovation, or the ability of United States firms to meet foreign competition. Similarly, this action is not deemed "significant" for purposes of Department of Transportation procedures for internal review of regulatory actions. The economic impacts of this amendment are so minimal as to not warrant preparation of a full regulatory evaluation, since the amendment merely permits the use of certain rearview mirrors which were previously prohibited.

Pursuant to the Regulatory Flexibility Act, the agency has considered the impact of this rulemaking action on small entities. The agency certifies that this action will not have a significant economic impact on a substantial number of small entities. Therefore, a regulatory flexibility analysis is not required for this action. The agency has concluded that few, if any, manufacturers of rearview mirrors are small entities and that the impacts of this rule on those companies which decide to take advantage of the new alternative method of compliance should be small.

Issued on August 18, 1982.

Raymond A. Peck, Jr.
Administrator

47 F.R. 38698
September 2, 1982

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirror Systems

Docket No. 71-3a; Notice 7

ACTION: Final rule and response to petitions.

SUMMARY: This notice responds to a petition for reconsideration filed by Volkswagen of America regarding a recent amendment to Federal Motor Vehicle Safety Standard (FMVSS) 111, and to a related petition for rulemaking filed by Toyota Motor Corporation. The amendment to FMVSS 111 permitted the use of exterior passenger side convex mirrors on passenger cars and trucks, multipurpose passenger vehicles and buses other than schoolbuses with a gross vehicle weight rating of 10,000 pounds or less to meet the field of view requirements of that standard. The amendment required that such convex mirrors must have "indelibly etched" on the mirror's surface the warning "Objects in Mirror Are Closer Than They Appear." The amendment also specified a maximum radius of curvature requirement for such mirrors. The agency is denying Volkswagen requests that the warning and maximum radius requirements be deleted, but in response to Volkswagen's and Toyota's petition, is modifying the warning requirements to permit the warning to be permanently marked on the mirror by methods other than etching.

DATE: This amendment is effective on August 26, 1983.

SUPPLEMENTARY INFORMATION: On September 2, 1982, NHTSA published an amendment to FMVSS 111, Rearview Mirrors. Prior to this amendment, the standard specified that field of view requirements (i.e., minimum permissible viewing area behind the vehicle) could be met only by using plane mirrors. This amendment, issued in response to a petition from General Motors Corporation, permitted field of view requirements to be met in part by using an exterior, passenger side convex mirror meeting certain specifications. Among these specifications were the requirements that a warning ("Objects in Mirror Are Closer Than They Appear") must be "indelibly etched" on the mirror and that the radius of curvature of the convex mirror must not exceed 65 inches. The warning was deemed necessary to alert drivers to the fact that the driver is using a convex mirror, which provides a different image than the common plane mirror. The maximum radius of curvature requirements was deemed necessary to limit the range of different image sizes to which drivers would be exposed and to provide an additional warning that the mirror being used is convex. With regard to the latter point, larger radius convex mirrors provide images which approach those of plane mirrors. The agency concluded that large radius convex mirrors might mislead drivers into thinking that a mirror was plane, when in fact it was convex and the distances from following vehicles was less than the drivers would realize.

With respect to the warning requirement, Volkswagen argues in its October 4 petition for reconsideration that the requirement imposes a trade barrier, since other countries do not require a warning and an English language warning would be of no use in non-English speaking countries. The agency agrees that this requirement would, as a practical matter, require manufacturers to use different convex mirrors (at least with regard to the warning lettering) in vehicles sold in the U.S. than in vehicles sold in some other countries. However, as noted in the September 2 final rule, the agency's research indicates that providing a clear warning is necessary, given the relative inexperience of U.S.

drivers in using automotive convex mirrors. Accordingly, the agency is denying Volkswagen's request to delete the warning requirement altogether.

Nevertheless, in response to Volkswagen's petition and an October 6, 1982 rulemaking petition submitted by Toyota Motor Corporation, the agency will amend the warning requirement to facilitate compliance with it. Making this change may reduce the burdens associated with having to provide different mirrors for different markets. Toyota pointed out that the requirement that the warning be "indelibly etched" on the mirror unnecessarily restricts the methods available for assuring that the warning is permanently marked on the mirror. "Etching" implies that lettering is produced by the corrosive action of an acid on the mirror. Toyota suggests that sandblasting or glass-based ink printing can equally well produce permanent lettering on mirrors whose reflective surface is at the back side of the mirror glass. The agency agrees that manufacturers should be given additional flexibility in choosing their means of compliance. The agency is amending FMVSS 111 to permit the use of any process which assures that the warning is "permanently and indelibly marked" on the mirror's reflective surface. The agency cannot foresee all possible methods which might be used to "permanently and indelibly" mark warning lettering on a mirror and does not wish to unnecessarily limit the use of new technology in this area. The agency notes that exterior-surface painting or the use of a plastic decal, either of which could be removed or become illegible, would not be deemed "permanent and indelible" by the agency.

Volkswagen also objected to the warning requirement on the basis that no advance notice or opportunity to comment was provided with regard to the enactment of that provision. However, the agency specifically sought comment on this issue and suggested that warning lettering might be required. See 43 FR 51660, November 6, 1978. Further, the provision was adopted in response to several comments suggesting that warning lettering be required.

With regard to the maximum radius of curvature requirement, Volkswagen argues that the requirement differs from European requirements (which impose no maximum) and therefore imposes a trade barrier. Volkswagen also argues that large radius mirrors closely resemble plane mirrors in terms of the image provided, and therefore present no safety concerns. However, the agency still feels this requirement is necessary, given the relative inexperience of U.S. drivers with convex mirrors. The maximum radius requirement assures that drivers will be able to tell from the appearance of the image when they are using a convex mirror. It also assures that drivers will not be exposed to a wide range of image sizes and corresponding depth perception and distortion effects. Further, mirrors meeting the U.S. maximum radius requirements may still be used in European countries, which have no maximum radius requirement. Therefore, this requirement will be retained.

The agency is making this amendment effective immediately upon publication, since the amendment "relieves a restriction" within the meaning of 5 U.S.C. 553(d)(1), by permitting the use of additional methods for marking mirrors. The agency also finds that making this amendment effective immediately is in the public interest, in accordance with section 103(c) of the National Traffic and Motor Vehicle Safety Act, since doing so will facilitate the use of additional mirrors as soon as possible. Also, since the amendment relieves a restriction in FMVSS 111, providing 180 days lead time is unnecessary.

NHTSA has determined that this proceeding does not involve a "major rule" within the meaning of section 1, paragraph (b), of Executive Order 12291 because it is not likely to have an effect on the economy of $100 million or more, to result in a major increase in costs or prices, or to have a significant adverse effect on competition, employment, investment, productivity, innovation, or the ability of United States firms to meet foreign competition. Similarly, this action is not deemed "significant" for purposes of Department of Transportation procedures for internal review of regulatory actions. The economic impacts of this amendment are so minimal as to not warrant preparation of a full regulatory evaluation, since the amendment merely permits the use of additional methods for labeling rearview mirrors.

Pursuant to the Regulatory Flexibility Act, the agency has considered the impact of this rulemaking action on small entities. I certify that this action will not have a significant economic impact on a substantial number of small entities. Therefore, a regulatory flexibility analysis is not required for this action. The agency has concluded that few, if any, manufacturers of rearview mirrors are small entities and that the impacts of this rule on those companies which decide to take advantage of the new alternative methods of labeling should be small. Since this action will impose no new costs, the action will not affect small governmental units or other organizations which purchase automobiles.

In consideration of the foregoing, Section 5.4.2 of 49 CFR 571.111 is revised to read as follows:

*§ 571.111 **Standard No. 111; Rearview Mirrors***

* * * * *

Section 5.4.2 Each convex mirror shall have permanently and indelibly marked at the lower edge of the mirror's reflective surface, in letters not less than 3/16 of an inch nor more than 1/4 inch high the words "Objects in Mirror Are Closer Than They Appear."

* * * * *

Issued on August 19, 1983

Diane K. Steed,
Deputy Administrator

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors

[Docket No. 81-21; Notice 2]

ACTION: Final rule.

SUMMARY: This rule amends Federal Motor Vehicle Safety Standard (FMVSS) 111 to permit the use of nonuniform radius of curvature school bus mirrors to view the area immediately in front of the bus. Previously, only uniform radius mirrors could be used for this purpose. This action is taken in response to a petition from the North Carolina State Board of Education, and is intended to permit the use as original equipment of mirrors which provide a wider field of view of the area in front and along the side of the bus. The improved view will aid in detecting the presence of children in those areas.

EFFECTIVE DATE: September 6, 1983.

SUPPLEMENTARY INFORMATION: FMVSS 111 establishes requirements for mirror systems used on a variety of motor vehicles, including school buses. One requirement of that standard with regard to school buses is that those vehicles must have a crossview mirror permitting the bus driver to view the area in front of the bus. These mirrors are intended to aid bus drivers in determining, prior to moving from a stopped position (typically after loading or unloading children at a bus stop), whether any children are located in the area immediately in front of the bus. Being able to check those areas is important since, on average, approximately 40 pedestrians each year are involved in school-bus-related accidents.

Prior to the amendments made by this notice, the standard provided that crossview mirrors must be convex and have at least 40 square inches of reflective surface. Such mirrors must have a single radius of curvature which is at least 12 inches but no more than 25 inches. These specifications were intended to assure not only that the image views in the mirror would not be unduly distorted and would be large enough to be clearly seen, but also that the field of view of the mirror would be great enough to permit a view of the entire area in front of the bus.

North Carolina Board of Education petitioned the agency to permit the use of one specific type of mirror manufactured by Mirror-Lite Co. The radius of curvature of this mirror varies from 3.5 inches near the outer edge of the mirror to approximately 4.5 inches in the central area. These small radii of curvature provide a much wider field of view than the crossview mirrors previously specified in FMVSS 111, permitting a view of not just the area in front of the bus but also along the side of the bus. Although this wider field of view is gained at the expense of a smaller image size and greater optical distortion, the agency considers the quality of the image to be adequate for its intended purpose. Further, the wider field of view could improve safety by enabling school bus drivers to see children that they could not see with current mirrors.

Therefore, the agency proposed to amend FMVSS 111 to permit the use of mirrors of this type. See 46 FR 60481, December 10, 1981. This proposal would have deleted minimum and maximum radius of curvature requirements and would have permitted the use of any nonuniform mirror surface.

The agency received approximately 50 comments on its proposal, mainly from State boards of education and school bus operators. Most of these commenters supported the use of nonuniform radius mirrors like the Mirror-Lite design, pointing out that the wider field of view provided by such mirrors should promote safety. Several other commenters suggested modifications to the agency's proposal. Based on these comments and the agency's further consideration of the relevant issues, the agency is amending FMVSS 111 to permit the use of mirrors like the Mirror-Lite design, although it is not limited to that design.

The agency received a number of comments regarding radius of curvature requirements. As noted above, FMVSS 111 has provided that crossview mirrors must have a single radius of curvature which must be at least 12 inches but not more than 25 inches. The maximum radius requirement was imposed to assure that the mirror provides an adequate field of view. An overly large radius would provide an inadequate view since field of view decreases as radius of curvature increases. The minimum radius requirement was imposed to assure adequate image size and quality; as radius of curvature decreases, image size also decreases, and image distortion increases. Thus, the radius of curvature specifications reflect a trade-off between field of view on one hand and image size and accuracy on the other hand. The agency's proposal, in seeking to permit the use of mirrors with radii in the 3.5 inches to 4.5 inches range, deleted all radius of curvature requirements.

Donnelly Mirrors, Inc., pointed out that permitting unlimited variation in a mirror's radius of curvature would permit unacceptable levels of optical distortion. It was not the agency's intention to completely remove restrictions on radius of curvature for crossview mirrors. Rather, it was the agency's desire to permit the use of an additional type of mirror which had been shown to be highly effective. Therefore, this final rule retains the current maximum radius of curvature requirement and establishes a minimum radius requirement consistent with the Mirror-Lite design. Requirements were also established in response to this comment to assure that the mirror surface does not have major, abrupt changes in radius of curvature or other surface discontinuities which could cause excessive optical distortion.

The Grote Manufacturing Company (a mirror producer) and the Truck Safety Equipment Institute argued that the image produced by a mirror with a radius of curvature below 12 inches is too small to be readily identifiable. The agency disagrees. Based on NHTSA's own evaluation of the Mirror-Lite design in actual school bus service, the image provided by the mirror is adequate to tell the bus driver whether a child is in front of the bus or along the side of the bus. The agency was also impressed by the numerous comments received from bus operators who had experience with after market nonuniform radius mirrors, and found them to be superior in actual service to the uniform radius mirror. While it is true that the image provided by the Mirror-Lite mirror is smaller and more distorted than that of a uniform 12-inch radius mirror, the agency believes that the image size and quality for these mirrors is adequate for its intended purpose and that these disadvantages are fully offset by the wider field of view provided by the former. It should be pointed out that this mirror is to be used for a very limited purpose, i.e., to determine whether a child is in close proximity to the front of the school bus or along the side, especially where the child exits from the bus. While a small radius mirror might be inadequate to judge distance and velocity as would be required in an automotive rearview mirror, the agency finds them adequate for their intended purpose, and even superior in terms of providing an additional view of the side of the bus, another potentially dangerous area.

Several commenters suggested imposing performance requirements for the field of view of the crossview mirror, rather than specifying the radius of curvature. While the agency believes this to be a desirable goal, it is beyond the scope of this rulemaking. Specifying the field of view is a complicated task, which the agency is still evaluating in the context of its major rulemaking on rearview mirrors. See 43 FR 51657, November 6, 1978.

Grote also recommended clarifying the requirement that crossview mirrors must have 40 square inches of reflective surface. They suggested that this area requirement should be expressed in terms of the effective projected area of the reflective surface measured on a plane at right angles to the axis of the mirror. Without such clarification, the requirement could be interpreted to refer to surface area, which would vary for a mirror of given diameter, depending on the radius of curvature. The agency agrees and is adopting Grote's suggestion for the newly authorized mirrors.

Several commenters suggested that FMVSS 111 should require the use of two convex crossview mirrors, one mounted on each side of the bus. The current requirement is for only one mirror mounted on either side of the bus, but many school buses employ additional crossview mirrors. The agency believes that the use of additional crossview mirrors on each side of the bus would provide both a better view of the front of the bus and a view of each side of the bus. The side area can be a major concern, particularly on the passenger exit side, since children standing in that area can be hit as the bus pulls away from the stop and makes a turn. However, requiring additional mirrors is a matter beyond the scope of the proposal issued in this rulemaking. The agency will consider requiring more additional mirrors in subsequent rulemaking. In the meantime, school districts are strongly encouraged to use additional mirrors as necessary to permit the driver to view the areas along the front and both sides of the bus.

The agency has considered the economic and other effects of this action and has determined that the rule is not a major rule within the meaning of Executive Order No. 12291. The agency has further determined that the action is not significant within the meaning of the Department of Transportation's regulatory procedures. The basis for these determinations is that the rule relaxes a design restriction in the current standard. It does not require school buses to be equipped with new mirrors; it merely gives manufacturers the flexibility to use a different type of mirror, whose performance is at least as effective as current mirrors. Accordingly, the agency has not prepared a full regulatory evaluation.

The agency has also considered the effect of this action in relation to the Regulatory Flexibility Act, and I certify that it would not have a significant economic effect on a substantial number of small entities. The effect of the amendment on small businesses is to give manufacturers the option of using new types of mirrors. It does not require any manufacturer to change its current practice.

The action will not have a significant effect on a substantial number of small government jurisdictions and small organizations. Those entities are affected because they are purchasers of school buses. It is unknown how many of them will exercise the voluntary choice of using new types of mirrors, but the cost impact, if any, should be minimal. Accordingly, no regulatory flexibility analysis has been prepared.

This action is being made effective on publication, to permit the immediate use of crossview mirrors which are at least equivalent to current mirrors in safety performance, and may be superior to current mirrors. Since this action "relieves a restriction," the immediate effective date is authorized under 5 U.S.C. 553(d). Since the immediate effective date may well promote safety and the amendment is merely an alternative method of compliance which does not necessarily impose additional costs or other burdens, the immediate effective date is in "the public interest" within the meaning of section 103(e) of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392(e).

In consideration of the foregoing, section 9.2 of 49 CFR 571.111 is amended to read as follows:

S9.2 *Outside crossview mirror.* Each school bus, except one which is a forward control vehicle, shall have a convex mirror which complies with the requirements in paragraphs (a) and (b) of this section.

(a) The convex mirror shall have a radius of curvature not less than 3.5 inches and not more than 25 inches. A convex mirror whose radius of curvature at its periphery is not less than 12 inches and not more than 25 inches shall have a surface area which is not less than 40 square inches. A convex mirror whose radius of curvature at any point on the mirror is less than 12 inches shall have a projected area of not less than 40 square inches, measured on a plane at a right angle to the mirror's axis. A convex mirror with a nonuniform radius shall comply with the following criteria:

(1) The radius at the periphery of the mirror shall be not less than 75 percent of the radius at the center of the mirror.

(2) Along the intersection of any plane containing the axis of symmetry of the mirror and the surface of the mirror, the length of the radius, as measured by a spherometer, shall be monotonically nonincreasing when moving from the axis of symmetry to the periphery along the intersection.

(3) Along the intersection described in paragraph (a)(2) of this section there shall be no discontinuities in the slope of the surface of the mirror.

(b) The mirror shall be installed with a stable support, and mounted so as to provide the driver a view of the front bumper and the area in front of the bus.

Issued on August 30, 1983.

Diane K. Steed
Deputy Administrator

48 FR 40260
September 6, 1983

MOTOR VEHICLE SAFETY STANDARD NO. 111

Rearview Mirrors

S1. Scope. This standard specifies requirements for the performance and location of rearview mirrors.

S2. Purpose. The purpose of this standard is to reduce the number of deaths and injuries that occur when the driver of a motor vehicle does not have a clear and reasonably unobstructed view to the rear.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, school buses and motorcycles.

S4. Definition. "Unit magnification mirror" means a plane or flat mirror with a reflective surface through which the angular height and width of the image of an object is equal to the angular height and width of the object when viewed directly at the same distance except for flaws that do not exceed normal manufacturing tolerances. For the purposes of this regulation a prismatic day-night adjustment rearview mirror one of whose positions provides unit magnification is considered a unit magnification mirror.

[“Convex mirror” means a mirror having a curved reflective surface whose shape is the same as that of the exterior surface of a section of a sphere. (47 F.R. 38698—September 2, 1982. Effective: September 2, 1982)]

S5. Requirements for passenger cars.

S5.1. Inside rearview mirror. Each passenger car shall have an inside rearview mirror of unit magnification.

S5.1.1. Field of view. Except as provided in S5.3, the mirror shall provide a field of view with an included horizontal angle measured from the projected eye point of at least 20 degrees, and sufficient vertical angle to provide a view of a level road surface extending to the horizon beginning at a point not greater than 200 feet to the rear of the vehicle when the vehicle is occupied by the driver and four passengers or the designed occupant capacity, if less, based on an average occupant weight of 150 pounds. The line of sight may be partially obscured by seated occupants or by head restraints. The location of the driver's eye reference points shall be those established in Motor Vehicle Safety Standard No. 104 (§ 571.104) or a nominal location appropriate for any 95th percentile male driver.

S5.1.2. Mounting. The mirror mounting shall provide a stable support for the mirror, and shall provide for mirror adjustment by tilting in both the horizontal and vertical directions. If the mirror is in the head impact area, the mounting shall deflect, collapse or break away without leaving sharp edges when the reflective surface of the mirror is subjected to a force of 90 pounds in any forward direction that is not more than 45° from the forward longitudinal direction.

S5.2 Outside rearview mirror—driver's side.

S5.2.1. Field of view. Each passenger car shall have an outside mirror of unit magnification. The mirror shall provide the driver a view of a level road surface extending to the horizon from a line, perpendicular to a longitudinal plane tangent to the driver's side of the vehicle at the widest point, extending 8 feet out from the tangent plane 35 feet behind the driver's eyes, with the seat in the rearmost position. The line of sight may be partially obscured by the rear body or fender contours. The location of the driver's eye reference points shall be those established in Motor Vehicle Safety Standard No. 104 (§ 571.104) or a nominal location appropriate for any 95th percentile male driver.

S5.2.2. Mounting. The mirror mounting shall provide a stable support for the mirror, and neither the mirror nor the mounting shall protrude farther than the widest part of the vehicle body except to the extent necessary to produce a field of view meeting or exceeding the requirements of S5.2.1. The mirror shall not be obscured by the unwiped portion of the windshield, and shall be adjustable by tilting in both horizontal and vertical directions from the driver's seated position. The mirror and mounting shall be free of sharp points or edges that could contribute to pedestrian injury.

S5.3 Outside rearview mirror passenger's side. Each passenger car whose inside rearview mirror does not meet the field of view requirements of S5.1.1 shall have an outside mirror of unit magnification or a convex mirror installed on the passenger's side. The mirror mounting shall provide a stable support and be free of sharp points or edges that could contribute to pedestrian injury. The mirror need not be capable of adjustment by tilting in both horizontal and vertical directions.

S5.4 Convex mirror requirements. Each motor vehicle using a convex mirror to meet the requirements of S5.3 shall comply with the following requirements:

S5.4.1 When each convex mirror is tested in accordance with the procedures specified in S12 of this standard, none of the radii of curvature readings shall deviate from the average radius of curvature by more than plus or minus 12.5 percent.

S5.4.2 [Each convex mirror shall have permanently and indelibly marked at the lower edge of the mirror's reflective surface, in letters not less than 3/16 inch or more than 1/4 inch high, the words "Objects in Mirror Are Closer Than They Appear." (48 F.R. 38842—August 26, 1983. Effective: August 26, 1983)]

S5.4.3 The average radius of curvature of each such mirror, as determined by using the procedure in S12, shall be not less than 35 inches and not more than 65 inches.

S6 Requirements for multipurpose passenger vehicles, trucks, and buses, other than school buses, with GVWR of 10,000 pounds or less.

S6.1 Each multipurpose passenger vehicle, truck and bus, other than a school bus, with a GVWR of 10,000 pounds or less shall have either—

(a) Mirrors that conform to the requirements of S5; or

(b) Outside mirrors of unit magnification, each with not less than 19.5 in^2 of reflective surface, installed with stable supports on both sides of the vehicle, located so as to provide the driver a view to the rear along both sides of the vehicle, and adjustable in both the horizontal and vertical directions to view the rearward scene.

S7. Requirements for multipurpose passenger vehicles and trucks with a GVWR of more than 10,000 and less than 25,000 pounds and buses, other than school buses, with a GVWR of more than 10,000 pounds.

S7.1. Each multipurpose passenger vehicle and trucks with a GVWR of more than 10,000 pounds and less than 25,000 pounds and each bus, other than a school bus, with a GVWR of more than 10,000 pounds shall have outside mirors of unit magnification, each with not less than 50 in^2 of reflective surface, installed with stable supports on both sides of the vehicle. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the vehicle and shall be adjustable both in the horizontal and vertical directions to view the rearward scene.

S8. Requirements for multipurpose passenger vehicles and trucks with a GVWR of 25,000 pounds or more.

S8.1 Each multipurpose passenger vehicle and truck with a GVWR of 25,000 pounds or more shall have outside mirrors of unit magnification, each with not less than 50 in^2 of reflective surface, installed with stable supports on both sides of the vehicle. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the vehicle and shall be adjustable both in the horizontal and vertical directions to view the rearward scene.

S9. Requirements for school buses.

S9.1. Outside rearview mirrors. Each school bus shall have outside mirrors of unit magnification, each with not less than 50 in^2 of reflective surface, installed with stable supports on both sides of the vehicle. The mirrors shall be located so as to provide the driver a view to the rear along both sides of the vehicle and shall be adjustable both in the horizontal and vertical directions to view the rearward scene.

S9.2 Outside cross view mirror. [Each school bus, except one which is a forward control vehicle, shall have a convex mirror which complies with the requirements in paragraphs (a) and (b) of this section.

(a) The convex mirror shall have a radius of curvature not less than 3.5 inches and not more than 25 inches. A convex mirror whose radius of curvature at its persphery is not less than 12 inches and not more than 25 inches shall have a surface area which is not less than 40 square inches. A convex mirror whose radius of curvature at any point on the mirror is less than 12 inches shall have a projected area of not less than 40 square inches, measured on a plane at a right angle to the mirror's axis. A convex mirror with a non-uniform radius shall comply with the following criteria:

(1) The radius at the periphery of the mirror shall be not less than 75 percent of the radius at the center of the mirror.

(2) Along the intersection of any plane containing the axis of symmetry of the mirror and the surface of the mirror, the length of the radius, as measured by a spherometer, shall be monotonically non-increasing when moving from the axis of symmetry to the periphery along the intersection.

(3) Along the intersection described in paragraph (a) (2) of this section there shall be no discontinuities in the slope of the surface of the mirror.

(b) The mirror shall be installed with a stable support, and mounted so as to provide the driver a view of the front bumper and the area in front of the bus. (48 F.R. 40260—September 6, 1983. Effective: September 6, 1983)]

S10. Requirements for motorcycles.

S10.1. Each motorcycle shall have either a mirror of unit magnification with not less than 12.5 in^2 of reflective surface, or a convex mirror with not less than 10 in^2 of reflective surface and an average radius of curvature not less than 20 inches and not greater than 60 inches, installed with a stable support, and mounted so that the horizontal center of the reflective surface is at least 11 inches outward of the longitudinal centerline of the motorcycle. The mirror shall be adjustable by tilting in both the horizontal and vertical directions.

S11. Mirror construction. The average reflectance value of the reflective film employed on any mirror required by this standard, determined in accordance with SAE Recommended Practice J964a, August 1974, shall be at least 35 percent. If a mirror is of the selective position prismatic type, the reflectance value in the night driving position shall be at least 4 percent.

S12 Determination of Radius of Curvature.

S12.1 To determine the average radius of curvature of a convex mirror, use a 3-point linear spherometer, which meets the requirements of S12.2, at the 10 test positions shown in Figure 1 and record the readings for each position.

S12.2 The 3-point linear spherometer has two outer fixed legs 1.5 inches apart and one inner movable leg at the mid-point. The spherometer has a dial indicator with a scale that can be read accurately to 0.0001 inches, with the zero reading being a flat surface.

S12.3 The 10 test positions on the image display consist of two positions at right angles to each other at each of five locations as shown in Figure 1. The locations are at the center of the mirror, at the left and right ends of a horizontal line that bisects the mirror and at the top and bottom ends of a vertical line that bisects the mirror. None of the readings are within 0.25-inch border on the edge of the image display.

S12.4 At each test position, the spherometer is held perpendicular to the convex mirror-surface and a record is made of the reading on the dial indicator to the nearest 0.0001 inch.

S12.5 Convert the dial reading data for each of the 10 test positions to radius of curvature calculations using Table I. Consider the change as linear for dial readings that fall between two numbers in Table I.

S12.6 Calculate the average radius of curvature by adding all 10 radius of curvature calculations and dividing by ten.

S12.7 Determine the numerical difference between the average radius of curvature and each of the 10 individual radius of curvature calculations determined in S12.5.

S12.8 Calculate the greatest percentage deviation by dividing the greatest numerical difference determined in S12.7 by the average radius of curvature and multiply by 100.

INTERPRETATION

(1) When a supplemental mirror is furnished in addition to the inside rearview mirror and the driver's side outside rearview mirror, the supplemental mirror need not be adjustable from the driver's seat.

(2) The location of the driver's eye reference point may be that established in Motor Vehicle Safety Standard No. 104, or it may be a nominal location appropriate for any 95th percentile male driver.

(3) The horizontal angle is measured from the projected eye point, rather than the plane of the mirror.

32 F.R. 2413
February 3, 1967

TABLE I.—*Conversion Table From Spherometer Dial Reading To Radius of Curvature*

Dial reading	*Radius of curvature (in inches)*
.00330	85.2
.00350	80.4
.00374	75.2
.00402	70.0
.00416	67.6
.00432	65.1
.00450	62.5
.00468	60.1
.00476	59.1
.00484	58.1
.00492	57.2
.00502	56.0
.00512	54.9
.00522	53.9
.00536	52.5
.00544	51.7
.00554	50.8
.00566	49.7
.00580	48.5
.00592	47.5
.00606	46.4
.00622	45.2
.00636	44.2
.00654	43.0
.00668	42.1
.00686	41.0
.00694	40.5
.00720	39.1
.00740	38.0
.00760	37.0
.00780	36.1
.00802	35.1
.00822	34.2
.00850	33.1
.00878	32.0
.00906	31.0
.00922	30.5
.00939	30.0
.00960	29.3
.00980	28.7
.01004	28.0
.01022	27.5
.01042	27.0
.01060	26.5
.01080	26.0
.01110	25.3
.01130	24.9
.01170	24.0
.01200	23.4
.01240	22.7
.01280	22.0
.01310	21.5
.01360	20.7
.01400	20.1
.01430	19.7
.01480	19.0
.01540	18.3
.01570	17.9
.01610	17.5
.01650	17.1
.01700	16.6
.01750	16.1
.01800	15.6
.01860	15.1
.01910	14.7
.01980	14.2
.02040	13.8
.02100	13.4
.02160	13.0
.02250	12.5
.02340	12.0
.02450	11.5
.02560	11.0
.02680	10.5
.02810	10.0
.02960	9.5
.03130	9.0
.03310	8.5

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO 112

Headlamp Concealment Devices—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, and Motorcycles

(Docket No. 1–16)

A proposal to amend Part 371 by adding Federal motor vehicle safety standard No. 112, Headlamp Concealment Devices—Passenger Cars, Multipurpose Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, and Motorcycles, was published as an advance notice of proposed rule making on October 14, 1967 (32 F.R. 14280) and as a notice of proposed rule making on December 28, 1967 (32 F.R. 20865).

Interested persons have been given the opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

Inadvertent actuation of a headlamp concealment devices, due to a defective condition thereby causing headlamps to be blacked out, has compromised the safety of occupants of the vehicle concerned and other highway users. There have been reports of several accidents and incidents caused by such inadvertent blacking out of headlamps. In addition, the Administrator considers headlamp concealment devices present a continuing hazard to motor vehicle safety in that they may inadvertently black out headlamps while headlamps are in use. This standard requires that fully opened headlamp concealment devices must remain fully opened whenever there is a loss of power to or within the device and whenever any malfunction occurs in components that control or conduct power for the operation of a concealment device. These requirements provide a fail-safe operation which serves to prevent further incidents of inadvertent blacking out of headlamps by headlamp concealment devices.

In addition, other safety performance criteria are established. Thus, whenever any malfunction occurs in components that control or conduct power for the actuation of the concealment device, additional means for fully opening each headlamp concealment device must be provided. A single mechanism must be provided for actuating the headlamp concealment device and illuminating the lights. The installation of each headlamp concealment device must be such that no component of the device, other than components of the headlamp assembly, need be removed when mounting, aiming and adjusting the headlamps. Headlamp beams that illuminate during opening and closing of the headlamp concealment device may not project to the left of or above the position of the beam in the fully opened position. Finally, within the temperature ranges specified, headlamp concealment devices must be fully opened in three seconds after actuation of the appropriate mechanism, except in the event of a power loss. These additional performance criteria meet the needs of motor vehicle safety by increasing the safe and reliable operation of headlamp concealment devices.

Several comments stated that a requirement for fail-safe operation under any combination of unforeseeable circumstances is unreasonable. The requirements expressed in S4.1 are not intended to impose responsibility for failures caused by abuse, poor maintenance practices or other conditions not encompassed by S4.1. Whether or not failure of a headlamp concealment device to remain in an open position once fully opened is a violation of the standard would, of course, depend upon whether the device failed under the conditions encompassed by the standard. Some comments requested that the conditions expressed in S4.1 be made test conditions and one commentator submitted a suggested test procedure to demonstrate compliance. Because of the wide variety of designs and types of headlamp concealment devices currently in use, no single demonstration procedure is appropriate for all. Consequently, prescription of a standard demonstration procedure is neither practicable nor feasible under the circumstances. The Administrator concludes that the needs of motor safety require that headlamp concealment devices be fail-safe. The Administrator further concludes that the most appropriate method of meeting those needs and of preventing further hazard from obstructed headlamps caused by headlamp concealment device failures is by the prescription of fail-safe operational criteria, as specified in S4.1. Accordingly, the requests are denied.

A number of comments stated that the 3-second operating time requirement and the aiming requirements for rotating headlamps would impose unreasonable burdens in retooling and redesigning if the January 1, 1969, effective date is to be met. Based upon the data presented, the Administrator agrees with these comments. Accordingly, S4.5 and S4.6 are made effective January 1, 1970.

Several comments recommended additional provisions expressly permitting headlamp concealment devices that are automatically actuated by light sensing mechanisms. This standard is not intended to prevent the use of light sensing mechanisms. Consequently, language has been added to clarify this intention if the light sensing mechanism meets the same operational requirements prescribed for switch operated headlamp concealment devices.

Several comments requested inclusion of a provision in S4.3 permitting an additional separate control that actuates only the headlamp concealment device. The Administrator considers permitting this additional control would not be in the best interests of motor vehicle safety. The requests are, therefore, denied.

Other comments suggested that rotating headlamps be required to return to the correctly aimed position after a specified minimum number of opening and closing cycles that power be provided for at least one opening cycle after the vehicle engine has been stopped for a specified length of time; that a warning device be required to indicate to the driver that the concealment devices are malfunctioning; that requirements for aiming and adjusting of headlamps be expanded to insure that vehicle body structure and lamp ornaments will not interfere with these operations; that the standard prohibit designs which permit snow and ice to accumulate over the sealed beam headlamp units; that requirements be included to assure capability for opening concealment devices that are frozen shut; and that a standard be established to prohibit the use of headlamp concealment devices. Although some of these suggestions appear to have merit, they are all beyond the scope of the notice and will, therefore, be considered for future rule making action.

In consideration of the foregoing, § 371.21 of Part 371 of the Federal motor vehicle safety standards is amended by adding Standard No. 112, Headlamp Concealment Devices—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, and Motorcycles . . . effective January 1, 1969.

This rule-making action is taken under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (Public Law 89-563, 15 U.S.C. sections 1392 and 1407) and the delegation of authority of April 24, 1968.

Issued in Washington, D.C., on April 24, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 6469
April 27, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD 112

Headlamp Concealment Devices—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses and Motorcycles

Motor Vehicle Safety Standard No. 112, published in the *Federal Register* on April 27, 1968 (33 F.R. 6469), specifies requirements for headlamp concealment devices for passenger cars, multipurpose passenger vehicle, trucks, buses and motorcycles manufactured after December 31, 1968.

Paragraph S4.1 requires that each fully opened headlamp concealment device remain fully opened whenever either or both of the following occur—

a. Any loss of power to or within the headlamp concealment device;

b. Any disconnection, restriction, short-circuit, circuit time delay, or other similar malfunction in any wiring, tubing, hose, solenoid or other component that controls or conducts power for operating the concealment device.

The purpose of S4.1 is to prevent a malfunctioning headlamp concealment device from inadvertently covering an illuminated headlamp. However, the Administrator has concluded that this paragraph may be construed to prohibit the closing of headlamp concealment devices while the headlamps are not illuminated. Consequently, paragraph S4.1 is being amended to clarify that its requirements apply only while the headlamps are illuminated.

Since this amendment provides clarification and imposes no additional burden on any person, notice and public procedure hereon are unnecessary. It is therefore found, for good cause shown, that an effective date earlier than 180 days after issuance is in the public interest and in the interest of motor vehicle safety.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, Motor Vehicle Safety Standard No. 112 (33 F.R. 6469), paragraph S4.1 is amended effective January 25, 1969. . . .

This amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and pursuant to the delegation of authority from the Secretary of Transportation, Part 1 of the regulations of the Office of the Secretary (49 CFR 1.4(c)).

Issued on January 22, 1969.

John R. Jamieson, Deputy
Federal Highway Administrator

34 F.R. 1246
January 25, 1969

MOTOR VEHICLE SAFETY STANDARD NO. 112

Headlamp Concealment Devices—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses and Motorcycles

S1. Scope. This standard specifies requirements for headlamp concealment devices.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, and motorcycles.

S3. Definitions. "Fully opened" means the position of the headlamp concealment device in which the headlamp is in the design open operating position.

"Headlamp concealment device" means a device, with its operating system and components, that provides concealment of the headlamp when it is not in use, including a movable headlamp cover and a headlamp that displaces for concealment purposes.

"Power" means any source of energy that operates the headlamp concealment device.

S4. Requirements.

S4.1 While the headlamp is illuminated, its fully opened headlamp concealment device shall remain fully opened whenever either or both of the following occur—

(a) Any loss of power to or within the headlamp concealment device;

(b) Any disconnection, restriction, short-circuit, circuit time delay, or other similar malfunction in any wiring, tubing, hose, solenoid or other component that controls or conducts power for operating the concealment device,

S4.2 Whenever any malfunction occurs in a component that controls or conducts power for the actuation of the concealment device, each closed headlamp concealment device shall be capable of being fully opened—

(a) By automatic means;

(b) By actuation of a switch, lever or other similar mechanism; or

(c) By other means not requiring the use of any tools. Thereafter, the headlamp concealment device must remain fully opened until intentionally closed.

S4.3 Except for cases of malfunction covered by S4.2, each headlamp concealment device shall be capable of being fully opened and the headlamps illuminated by actuation of a single switch, lever, or similar mechanism, including a mechanism that is automatically actuated by a change in ambient light conditions.

S4.4 Each headlamp concealment device shall be installed so that the headlamp may be mounted, aimed, and adjusted without removing any component of the device, other than components of the headlamp assembly.

S4.5 After December 31, 1969, the headlamp beam of headlamps that illuminate during opening and closing of the headlamp concealment device may not project to the left of or above the position of the beam when the device is fully opened.

S4.6 Except for cases of malfunction covered by S4.2, after December 31, 1969, each headlamp concealment device shall, within an ambient temperature range of −20 to +120 degrees F., be capable of being fully opened in not more than three seconds after actuation of the mechanism described in S4.3.

34 F.R. 1246
January 25, 1969

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 113

Hood Latch Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses (Docket No. 1–17)

A proposal to amend Part 371 by adding Federal motor vehicle safety Standard No. 113, Hood Latch Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses, was published as an advance notice of proposed rule making on October 14, 1967 (32 F.R. 14280), and as a notice of proposed rule making on December 28, 1967 (32 F.R. 20866).

Interested persons have been given the opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

This new standard requires that all motor vehicles to which it is applicable be equipped with a hood latch system. Additionally, in those instances where a vehicle is equipped with a front opening hood, which in any open position partially or completely obstructs a driver's forward view through the windshield, a second latch position on the hood latch system or a second hood latch system must be provided.

Available data reveals that inadvertent hood openings pose a serious hazard to the safe operation of motor vehicles, particularly in the case of front opening hoods. By requiring a hood latch system for all hoods, and under certain circumstances, a second position on that system or an independent second system, this standard will help to reduce incidents of inadvertent hood openings.

All the comments support the need for a hood latch system or hood latch systems, as the case may be. Several commentators requested inclusion of a definition of "hood" and "front opening hood." The Administrator agrees that "hood" should be defined and has defined it as any exterior movable body panel forward of the windshield used to cover an engine, luggage, storage, or battery compartment. However, the Administration concludes that a definition of "front opening hood" is unnecessary; that phrase is sufficiently definite and is clearly distinguishable from a "side opening" or "rear opening" hood.

Several commentators conditioned their support upon the understanding that the requirement for front opening hoods could be met by a single latch system with two positions, by two separate primary latch systems, or separate primary and secondary latches. Language changes have been made to S4.2 to clarify that all of these types of installations are acceptable.

Several commentators expressed concern over the lack of quantitative performance criteria for hood latch systems. The Administrator finds that additional research and study are necessary before meaningful quantitative performance criteria can be appropriately specified.

In consideration of the foregoing, § 371.21 of Part 371 of the Federal motor vehicle safety standards is amended by adding Standard No. 113, Hood Latch Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses . . . effective January 1, 1969.

This rule making action is taken under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (Public Law 89–563, 15 U.S.C. sections 1392 and 1407), and the delegation of authority of April 24, 1968.

Issued in Washington, D.C., on April 24, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 6470
April 27, 1968

MOTOR VEHICLE SAFETY STANDARD NO. 113

Hood Latch Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

S1. Purpose and scope. This standard establishes the requirement for providing a hood latch system or hood latch systems.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses.

S3. Definitions. "Hood" means any exterior movable body panel forward of the windshield that is used to cover an engine, luggage, storage, or battery compartment.

S4. Requirements.

S4.1 Each hood must be provided with a hood latch system.

S4.2 A front opening hood which, in any open position, partially or completely obstructs a driver's forward view through the windshield must be provided with a second latch position on the hood latch system or with a second hood latch system.

33 F.R. 6471
April 27, 1968

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection—Passenger Cars

(Docket No. 1–21)

A proposal to amend § 371.21 of Part 371, Federal Motor Vehicle Safety Standards by adding a new standard, Theft Protection—Passenger Cars, was published in the *Federal Register* on December 28, 1967 (32 F.R. 20866).

Interested persons have been afforded an opportunity to participate in the making of the standard. Their comments and other available information have been carefully considered.

Responses to the notice and other information have demonstrated that stolen cars constitute a major hazard to life and limb on the highways. The evidence shows that cars operated by unauthorized persons are far more likely to cause unreasonable risk of accident, personal injury, and death than those which are driven by authorized individuals. Further, the incidence of theft, and hence the risk of accidents attributable thereto, is increasing. According to a recent study by the Department of Justice there were an estimated 94,000 stolen cars involved in accidents in 1966, and more than 18,000 of these accidents resulted in injury to one or more people. On a proportionate basis, 18.2 percent of the stolen cars became involved in accidents, and 19.6 percent of the stolen-car accidents resulted in personal injury. The same study predicted that automobile thefts in 1967 total about 650,000; about 100,000 of these stolen cars could be expected to become involved in highway accidents. Comparing these figures with statistics for vehicles which are not stolen, the approximate rate for stolen cars would be some 200 times the normal accident rate for other vehicles. Thus, a reduction in the incidence of auto theft would make a substantial contribution to motor vehicle safety. It would not only reduce the number of injuries and deaths among those who steal cars, it would also protect the many innocent members of the public who are killed and injured by stolen cars each year.

The President's Commission on Law Enforcement and Administration of Justice, in its report "The Challenge of Crime in a Free Society," noted the rising cost in lives and dollars as a result of auto theft, highlighted the need for measures to reduce auto thefts and suggested that "The responsibility could well be assigned to the National Highway Safety Agency as part of its program to establish safety standards for automobiles." (pp. 260–261).

The Administrator has concluded that a standard that would reduce the incidence of unauthorized use of cars meets the needs for motor vehicle safety. Consequently, he rejects those comments on the proposed standard which questioned its validity on the ground that it is not related to improving motor vehicle safety. As indicated below, amateur car thieves make up the majority of those unauthorized drivers who become involved in motor vehicle accidents. Many of these thieves make use of keys left in the ignition locks to start the cars they steal. Hence, the standard requires each car to be equipped with a device to remind drivers to remove the key when leaving the car. The number of car thieves who start cars with so-called "master keys" and devices which bypass the lock is also large enough to produce a significant safety hazard. Therefore, the standard also requires devices which tend to defeat this category of thief: A large number of locking-system combinations and a steering or self-mobility lock.

Several comments urged that the warning-device requirement be eliminated from the standard upon the ground that the removal of the key is the driver's responsibility. It was also said that, since any locking system, no matter how it is constructed, can be defeated by persons possessing sufficient skill, equipment, and tenacity, provisions for ensuring removal of ignition keys would be futile because a thief need not make use of a key.

As the Department of Justice survey mentioned above demonstrates, however, the large majority of car thieves are amateurs, almost half of whom are engaged in so-called "joyriding." The evidence shows that a high proportion of these thieves, most of whom are juveniles, start the cars' engines simply by using the key which has been left in the ignition lock. It is, of course, the operator's responsibility to remove the key when the car is left unattended and drivers should continue to be exhorted or required to take this elementary precaution. Nevertheless, many do not, and the interest of safety would be promoted by the existence of a visible or audible warning device on the car, reminding the driver when he has neglected his responsibility. This is an instance in which engineering of vehicles is more likely to have an immediate beneficial impact than a long-range process of mass education.

The requirement of a warning when the key is left in the lock was also the subject of several comments which asked that the warning be required when the front-seat passenger's door, as well as the driver's door, is opened. There is considerable validity in the contention that the device should operate upon the opening of either door, particularly because, in some jurisdictions, exiting from a car on the left side is prohibited in certain circumstances. However, the notice of proposed rule making stated that the standard under consideration made the warning-device requirement applicable only when the driver's door is opened. Information available to the Administrator shows that development of such warning devices has concentrated on warnings that are activated only in the event the driver's door is opened while the key remains in the lock. To extend this requirement to the opening of either door might necessitate both the initiation of new rulemaking proceedings and an extension of the standard's effective date. For these reasons, the requirement is, with minor exceptions discussed below, in substance unchanged from the one which appeared in the notice of proposed rulemaking. Extension of the requirement to passenger-door warning devices will be kept under consideration.

The January 1, 1970, effective date also remains unchanged. Most of the comments which focused on the proposed effective date stated that the standard could be complied with by that date. One manufacturer sought a 1-year extension on the ground that it could not produce a steering or mobility lock in sufficient time to equip its automobiles with such a device by January 1, 1970. Although this comment alleged that data in the possession of its author showed that the cost of purchasing and installing a device to comply with the standard would impose an unreasonable economic burden, neither those data nor the basis for the company's conclusion have been supplied to the Administration. In short, nothing supported the request except the broad generalization that the proposed effective date would cause some undefined hardship. Balancing this unsubstantiated generalization against the increase in deaths and injuries that postponing the effective date for a year would probably cause, the Administrator has concluded that a change in the effective date to January 1, 1971, would not be in the interest of safety, that the January 1, 1970, effective date is a practicable one, and that the request to extend it for 1 year is denied.

Many persons who responded to the notice asked that specific theft protection devices be prescribed. These specific devices included brake locks and so-called "pop-out" keys which automatically eject from the locking system, to devices which purportedly make by-passing the ignition switch impossible. The Administrator concludes that it would be unwise to establish a standard in terms so restrictive as to discourage technological innovation in the field of theft inhibition. Consequently, the standard has been framed to permit as many specific devices as possible to meet its requirements. In addition, the standard does not preclude the use of supplementary theft protection measures, such as the "pop-out" key, so long as automobiles comply with the standard's minimum requirement.

In drafting the standard, a number of revisions were made in the language employed in the notice of proposed rulemaking. Many of these revisions clarify definitional problems that were raised in responses to the notice. The term "key" is defined so as to include methods of activating the locking system other than the commonly accepted concept of a key. The term "combination" was defined to clarify its meaning, and the 1,000-combinations requirement has been changed to make it clear that, after the standard's effective date, each manufacturer must produce at least 1,000 different locking system combinations, unless he manufactures less than 1,000 passenger cars. In response to comments which pointed out the impossibility of constructing a system which, upon removal of the key, would prevent operation of the powerplant absolutely and in all events, the provisions of paragraph S3(a) of the notice were revised to require only that removal of the key must prevent normal activation of the powerplant. Paragraph S4.2 represents a clarification of the requirement contained in paragraph S3.3 of the notice. It is intended to permit the driver of a car to turn off the engine in emergency situations while the car is in motion without also activating the steering or self-mobility lock. Other minor changes were made for amplification or clarification.

Shortly after the issuance of this standard, the Administrator will issue a notice of proposed rulemaking to determine the practicability of improving the standard by adding a requirement that key locking systems be designed and constructed to preclude accidental or inadvertent activation of the deterrent required by S4.1(b) while the car is in motion. The notice will propose an effective date for the additional requirement identical to that of the present standard: January 1, 1970.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 114, . . . , effective January 1, 1970.

In accordance with section 103(c) of the National Traffic and Motor Vehicle Safety Act of 1966, I find that it would be impractical to require compliance with this standard within 1 year and therefore it is in the public interest to adopt a later effective date.

This amendment is made under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority of April 24, 1968.

Issued in Washington, D.C., on April 24, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 6471
April 27, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection—Passenger Cars

(Docket No. 1–21)

The Administrator is amending Motor Vehicle Safety Standard No. 114, Theft Protection—Passenger Cars, for the purpose of making several clarifying changes to it. The standard was issued on April 24, 1968 (33 F.R. 6471) and becomes effective on January 1, 1970. After the standard was issued, the Administrator received a number of requests for interpretations or clarifying amendments. While each of the requests discussed below could have been disposed of by interpretation of the present standard, the Administrator has chosen to change the text of the standard in order to ensure that it is clear on its face.

Paragraph S4.1(b) of the standard, as adopted, requires each passenger car to have a key locking system that, with the key removed, will prevent "either steering or self-mobility of the car or both." Several persons pointed out that a literal interpretation of this provision would require a manufacturer who seeks to comply with the self-mobility requirement to install a system that prevents both forward and rearward self-mobility. In view of the improbability of a successful theft of a car capable only of rearward self-mobility, the Administrator agrees that such a literal interpretation would not be consistent with the general purpose of the standard. Therefore, paragraph S4.1(b) is being clarified by inserting the word "forward" before the word "self-mobility".

Several persons sought clarification of paragraph S4.4, which requires activation of a warning to the driver whenever the key has been left in the locking system and the driver's door is opened. The purpose of this provision is to prevent, as far as possible, drivers from inadvertently leaving the key in the ignition lock when the car is unoccupied. As stated in the preamble to the standard when it was adopted, "the standard requires each car to be equipped with a device to *remind* drivers to remove the key when leaving the car" (emphasis added).

It was pointed out that a literal reading of the phrase "left *in* the locking system" (emphasis added) would require activation of the warning regardless of the extent to which the key is inserted in the lock, even if the driver deliberately chooses to withdraw it partially from the lock. These comments argued that it was practically impossible to design a warning system that would function if, for example, the key is so far removed as to be dangling from the locking mechanism. It was the purpose of this provision to require activation of the warning device whenever the key is left in the lock in a position from which the lock can be turned. Once the driver has withdrawn the key beyond the position, he is presumably aware of the location of the key, and no warning need be given to him. Paragraph S4.4 is being amended to clarify this intent.

Paragraph S4.4 is also being amended to avoid the possibility of an interpretation that would prohibit use of a type of locking system and steering lock that has, in the past, been a successful deterrent against theft. In this system, the warning to the driver works in conjunction with the activation of the steering lock device. The steering lock is not activated when the key, after having been withdrawn from the ignition lock, is simply reinserted in the locking system. Nor is the warning to the driver actuated until the key is turned so that the steering lock is deactivated. As noted above, the purpose of paragraph S4.4 is not to guarantee that drivers will remove the key upon leaving the car; rather, it seeks to ensure that drivers do not inadvertently leave their keys in ignition locks. In all but a very small number of cases, a driver who has withdrawn and then reinserted the key cannot be said to have inadvertently left it in the locking system when he thereafter exits from the car. Therefore, paragraph S4.4 is being amended to make it clear that the warning device need not operate after the key has been removed and reinserted in the locking system without turning the key.

Finally, several persons pointed out that the language of paragraph S4.4 would require activation of the warning device even if the locking system is in the "on" or "start" position. A positive physical act is usually required to bring the system to the "on" position or the "start" position. Moreover, a forgetful driver would not normally leave the key in the "on" position if he opened his door with the intent of leaving the car unattended. In most cases, it is impossible for him to leave the key in the "start" position without physically holding it in that position. Hence, no valid purpose would be served by requiring the warning to be activated when the locking system is in either of those positions, and the standard is being amended to omit any implication that such a requirement is imposed.

Since these changes are clarifying and interpretive in nature, and since they impose no additional burden on any person, I find that notice and public procedure thereon is unnecessary.

In consideration of the foregoing, section 371.21 of Part 371, Federal Motor Vehicle Safety Standards, Motor Vehicle Safety Standard No. 114 (33 F.R. 6741) is amended, effective January 1, 1970, as set forth below.

(Secs. 103 and 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 C.F.R. 1.4(c))

Issued on June 9, 1969.

F. C. Turner
Federal Highway Administrator

June 13, 1969
34 F.R. 9342

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection—Passenger Cars

(Docket No. 1–21)

Driver-Warning Requirement—Denial of Petition for Amendment; Extension of Effective Date

General Motors Corporation has filed a petition for amendment of paragraph S4.4 of Motor Vehicle Safety Standard No. 114. That paragraph requires each passenger car manufactured after December 31, 1969 to have a warning to a driver who neglects to remove his key from the ignition lock before he leaves the car. As amended (34 F.R. 9342), the standard provides that the warning need not operate "after the key has been manually withdrawn to a position from which it may not be turned."

The basis of the petition is that, in the current-model General Motors system, manufacturing tolerances may be such as to permit a driver to manipulate the ignition key into a position at which the warning buzzer will be deactivated while the ignition lock remains operative. General Motors seeks an amendment to permit the warning to be inoperative "after the key has been manually withdrawn from the normal operating position."

Upon consideration of the petition and other evidence, the Administrator has concluded that it would not be in the public interest to grant the relief General Motors has requested. The purpose of paragraph S4.4 is to make it virtually impossible for a driver inadvertently to leave his key in the ignition lock when he exits and thereby to reduce car thefts along with the high potential for accidental injury and death that stolen cars have. If it were possible for a driver to manipulate the key so as to render the warning inoperative while, at the same time, to continue to operate the vehicle with the key in the lock, the salutary purpose of the warning requirement would be defeated. Therefore, the petition for amendment is denied.

However, the Administrator recognizes that the tolerance problem General Motors has raised is a genuine one. It may be related to the fact that General Motors attempted, in good faith, to manufacture cars that complied with Standard No. 114 well before the standard's effective date. This is a laudable action for which General Motors should not be penalized. Furthermore, the Administrator realizes that the General Motors system is installed not only on its own productoin but also in passengers car produced by other high-volume manufacturers.

Therefore, the Administrator has concluded that the effective date of paragraph S4.4 of Standard No. 114 should be extended to allow additional time to overcome the tolerance problem. According to the best information available at this time, it appears that a 90-day extension of the January 1, 1970 effective date will provide sufficient time for redesigning and retooling the General Motors system so that it fully conforms to the standard's requirements and to put the new system into production. This conclusion is based on the expectation that the problems involved will be attacked on an urgent, high priority basis, as they should be in view of the safety need that paragraph S4.4 meets. The Administrator may consider a further extension at a later date if additional evidence to justify such an extension is adduced at that time.

Because of the shortness of time before the effective date of Standard No. 114 and because extension of that effective date for compliance with paragraph S4.4 of the standard will impose no additional burden on any person, notice and public procedure hereon are found to be unnecessary and impracticable.

In consideration of the foregoing, the effective date of paragraph S4.4 of Motor Vehicle Safety

Standard No. 114, in § 371.21 of Part 371 is extended to April 1, 1970.

(Secs. 103 and 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.4(c)).

Issued on December 3, 1969.

F. C. Turner
Federal Highway Administrator

34 F.R. 19547
December 11, 1969

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO.114

Theft Protection
(Docket No. 1-21; Notice 3)

ACTION: Final rule.

SUMMARY: This notice extends the performance requirements of Standard No. 114, Theft Protection, to light trucks and vans. At present, the standard only applies to passenger cars. The effect of the extension will be to reduce the incidence of light truck and van thefts and subsequent disproportionate involvement of those stolen vehicles in injury-producing accidents. The notice also upgrades the performance requirements of the standard to prevent the driver from inadvertently locking up the steering wheel of a moving vehicle by removing the ignition key or shutting off the engine.

DATES: The effective date for passenger cars is September 1, 1982. The final rule is effective for multipurpose passenger vehicles and trucks having a gross vehicle weight rating of 10,000 pounds or less on September 1, 1983.

ADDRESSES: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (Docket hours: 8:00 a.m. to 4:00 p.m.).

FOR FURTHER INFORMATION CONTACT:
Nelson Erickson, Office of Vehicle Safety
Standards, National Highway Traffic Safety
Administration, 400 Seventh Street, S.W.,
Washington, D.C. 20590 (202-426-2720)

SUPPLEMENTARY INFORMATION: On May 1, 1978, the NHTSA published a notice of proposed rulemaking to extend the applicability of Standard No. 114, Theft Protection (49 CFR 571.114), to trucks with a gross vehicle weight rating (GVWR) of 10,000 pounds or less and all multipurpose passenger vehicles (43 FR 18577). The standard currently only applies to passenger cars. The proposal would have also upgraded some of the performance requirements of the standard and clarified others.

Consumers, safety organizations, insurance companies, police departments, locksmiths, vehicle manufacturers, and others submitted comments on the proposed standard. The final rule is based on a thorough evaluation of the data obtained in NHTSA research, data and views submitted in the comments and data obtained from other pertinent documents and reports. The most significant comments are discussed below.

Extending the Applicability

In recent years, the sale and use of light trucks and multipurpose passenger vehicles (MPV's), such as passenger vans and on-off road vehicles, has substantially increased. The rise in sales and use has been accompanied by an increase in the number of thefts of those vehicles. To reduce the incidence of light truck and MPV thefts and subsequent disproportionate involvement of those stolen vehicles in injury-producing accidents, the May 1978 notice proposed extending the requirements of Standard No. 114 to light trucks and MPV's. The extension was supported by such organizations as Allstate Insurance Company, American Automobile Association (AAA), Center for Auto Safety (CAS) and Chrysler Corporation. Several other motor vehicle manufacturers and the Motor Vehicle Manufacturers Association did not oppose the extension of the standard, but did object to some of the newly-proposed performance requirements. GM said that while more data were needed to justify the extension, it had voluntarily applied some anti-theft features to some of its light trucks and was considering using theft protection equipment on all its light trucks and vans. American Motors Corporation (AMC) also argued that a safety need had not been established. AMC and others also requested that if the extension were adopted, then open-body vehicles, such as some on-off road vehicles, should be exempt from the standard.

The agency is adopting the extension as proposed. The data cited by the agency in the May 1978 notice clearly establish that there is a safety need for reducing the number of motor vehicle thefts. That data showed that stolen cars are from 47 to 200 times more likely than non-stolen cars to be involved in accidents. Stolen cars are involved in one out of every 350 accidents and account for approximately 5,600 disabling injuries and 150 fatalities annually. Data available from the States and the Federal Bureau of Investigation indicate that the theft rate for light trucks and MVP's, especially vans, is increasing and is similar to the rate for passenger cars. At present, many light trucks and MPV's use the type of anti-theft devices that were unsuccessfully used on pre-1970 passenger cars, i.e., before adoption of Standard No. 114. Because of the disproportionate association of stolen vehicles with accidents, injuries and fatalities, the agency concludes the number of light truck and MPV thefts should be reduced by requiring those vehicles to have certain minimum anti-theft features currently found on passenger cars.

The agency is not adopting the exemption for open body-type vehicles sought by some manufacturers. This action by the agency will not pose any problems for those manufacturers. The concerns that they expressed about those vehicles' ability to comply with the proposed standard dealt with performance requirements that, as explained below, the agency has decided not to adopt. However, because of the accessibility of these vehicles' interiors, it is important to reduce their vulnerability to theft by requiring them to comply with the rest of the proposed requirements.

The notice proposed to extend the applicability of Standard No. 114 to all MPV's. The agency has decided, however, that the rule should apply only to MPV's whose GVWR is 10,000 pounds or less. NHTSA has decided not to extend the standard to MPV's with a GVWR greater than 10,000 pounds because these vehicles are generally not subject to joyrider theft.

Inadvertent Locking

To prevent the accidental locking of the steering system while the vehicle is in motion, the May 1978 notice proposed that the steering and the forward mobility of the vehicle not be impeded when the key is removed from the ignition or when the key is moved from one position to another in the steering wheel lock, such as from "on" to "off." The proposed requirements would have allowed the driver to shut off the engine in an emergency situation, such as when the vehicle suddenly accelerated due to a stuck throttle cable, without activating the vehicle's steering lock and losing control of the vehicle's steering or forward mobility. The proposal would have also prevented the steering lock from activating if the driver removed the ignition key from the steering lock while the vehicle was in motion. NHTSA proposed the requirements in response to a petition from R.L. Bean.

Almost all manufacturers supported the intent of the proposal to prevent inadvertent actuation of the steering lock. The manufacturers argued, however, that they currently have steering lock systems that would prevent inadvertent actuation. Many manufacturers have a system which requires the driver to stop the vehicle's forward motion and take a separate physical action in order to turn the key to the "lock" position and engage the steering wheel lock. For example, in vehicles that have a column-mounted transmission shifter and a steering column lock, the shifter must be moved into "park" or "reverse" before the key can be turned to "lock" and the steering lock engaged. The agency agrees that such systems effectively prevent a driver from activating the steering wheel lock while the vehicle is in forward motion.

The agency is concerned about other current systems which allow the driver to activate the steering lock while the vehicle is still in forward motion. For example, some manufacturers use a system which allows a driver to push a key release button or lever and move the key to the "lock" position, which engages the steering lock, while the vehicle is moving forward. The purpose of the key release system is to require the driver to perform a sequence of acts before locking the steering to reduce the possibility of activating the lock while the vehicle is in motion. However, some of those systems are designed in such a way that the driver can push the key release lever or button, hold it in place and then simultaneously turn the key to the "lock" position with the same hand. Thus, rather than requiring the driver to perform a sequence of separate and distinct acts before the steering wheel lock can be engaged, those systems allow the driver to simultaneously perform the two actions (pushing the key release device and turning the key to the "lock" position) necessary to engage the steering wheel lock.

To prevent the danger of activating the steering lock while the vehicle is in motion, the agency is prohibiting the use of systems which allow drivers to activate the key release device and simultaneously turn the key to the "lock" position with one hand. Manufacturers will still be permitted to use key release devices which are positioned in such a way that two hands must be used to activate the key release and then turn the key (e.g., a system where the key release device is on one side of the steering column and the ignition lock is on the other side) since those systems minimize the possibility of locking the steering while the vehicle is in motion by requiring a distinct sequence of separate acts that must be performed by two hands.

Several commenters, such as Mercedes-Benz and the Japan Automobile Manufacturers Association (JAMA), requested the agency to pattern its requirement on inadvertent activation of locking systems on the Economic Commission for Europe (ECE) regulation. The ECE regulation specifies that anti-theft devices which impede the steering or forward mobility of the vehicle cannot activate until the engine is off and the driver has performed another separate action other than turning the engine off, such as withdrawing the key. The agency has decided not to adopt the ECE regulation. The NHTSA believes that this rule does not effectively minimize the possibility of accidental lock-up, because it does not require the driver to perform a sequence of separate and distinct acts in order to activate the steering wheel lock.

Stronger Ignition Locking System

Manufacturers, such as GM, Ford, Mercedes and VW, supported a requirement that the ignition lock be designed to resist removal. However, they criticized the agency's proposal that the ignition system become inoperative if any part of the lock were removed. For example, Ford argued that the proposal would require the ignition to be inoperative even if only a small portion of the lock were removed and the remaining portion of the lock still performed satisfactorily. The manufacturers argued that the agency needs to more specifically define the proposed performance requirements and establish an objective test procedure before issuing a final rule.

Requiring stronger ignition and steering locking systems is potentially one of the most promising ways to effectively reduce vehicle thefts. Even if a thief gains entry to a vehicle, the ignition and steering lock must be circumvented in order to drive the vehicle. Although some manufacturers voluntarily have taken steps to strengthen their ignition locks, it is too easy to remove the ignition lock and start the engine in many vehicles.

To develop an improved ignition lock requirement, NHTSA contracted with the National Bureau of Standards to do tensile, torque and extraction testing on current ignition lock systems (NHTSA Contract HS-9-02150). The report was completed this fall and is presently being evaluated by the agency. Upon completion of this evaluation, NHTSA will consider new rulemaking to propose specific performance requirements for ignition lock retention and ignition system operation.

Audible Warning

Passenger cars are currently equipped with a warning device to remind the driver to remove the key. The device activates when the key is left in the ignition lock and the car door is opened. The agency's proposal to require an audible warning and to require the warning device to sound for so long as the key is not removed after the door had been opened met with substantial opposition from consumers and vehicle manufacturers. They argued that the proposed sound level required for the warning device would be too loud and therefore irritating to vehicle occupants. MVMA and others also argued that the proposals would require a continual warning in many situations, such as parking lots, services areas and car washes, where keys are legitimately left in the ignition after the driver has left the vehicle. In addition, they argued that the power necessary to continually operate the warning device could cause battery failure.

Based on its evaluation of the comments, the agency has decided to retain the current warning requirement and not adopt the proposed requirement for a continuous, louder audible warning. The current requirement, which has reduced the incidence of theft due to keys left in the vehicle, will continue to have the beneficial effect of alerting the driver that he or she has left the key in the ignition lock.

Door Locking Systems

To make it more difficult for a thief to break into a vehicle, the May 1978 notice proposed that the door lock be shielded so that it cannot be released by external manipulative devices. The notice also proposed that the door lock buttons be tapered or of uniform thickness to prevent them from being easily opened by manipulative devices and that keys which operate an exterior lock not be able to operate the ignition lock. Vehicle manufacturers, AAA, locksmiths and others criticized these proposals because of the inconvenience and expense they would pose to drivers who inadvertently locked their keys in their vehicles and needed a locksmith to get into their vehicles. AAA noted that 340,000 out of the 17.2 million emergency road calls it responded to in 1977 involved drivers inadvertently locking their keys in their vehicles, argued that the proposed requirements would prevent legitimate service personnel from entering locked vehicles without breaking the windows or otherwise damaging the vehicle.

The Arthritic Society and some consumers were particularly critical of the proposal to require tapered or uniform size door lock buttons. They argued that such buttons would present problems to drivers and passengers with impaired movement of their fingers.

Some consumers and manufacturers also criticized the agency's two-key proposal, i.e., the one that would prevent a key which operates any exterior vehicle lock from operating the ignition lock. (GM currently uses a two-key system.) The commenters argued that using two keys to enter and start the vehicle would be inconvenient. In addition, manufacturers argued that the requirement was design restrictive and might impede the development of other innovative means of locking the door and ignition.

The agency has decided not to adopt these rulemaking proposals. As mentioned previously, using improved ignition/steering locks rather than increasing the amount of time needed to gain entry to the vehicle appears to be the best potential way to reduce vehicle thefts without inconveniencing vehicle users. Further, even in the absence of rulemaking, improvements are anticipated. Manufacturers are currently developing and using new door locking systems to improve vehicle security. The agency will continue to monitor the different door locking systems used by manufacturers to determine if rulemaking is needed.

Interior Hood Release and Shielded Wires

To delay the theft of a vehicle, the May 1978 notice proposed that the hood release be located inside the vehicle. Delaying access to the engine compartment would potentially make it more difficult to "hot wire" the ignition and start the vehicle. The notice also proposed that the ignition wires within the vehicle's interior be shielded so that it would be difficult to "hot wire" the ignition once the thief got inside the vehicle.

Manufacturers, such as GM and Volkswagen, opposed the interior hood release requirement, arguing that since a thief has to gain access to the interior of the vehicle to steal the car, the thief would then have access to the hood release. JAMA, AMC, Chrysler and other manufacturers objected to the shielding requirement, arguing it would make it more difficult to perform legitimate repair work on the ignition wires.

After re-evaluating these proposals, the agency has decided not to adopt them. As explained previously, the agency plans to concentrate its future rulemaking on the more effective route of improving ignition steering column locks. So long as the steering column lock has not been circumvented, a thief cannot steal a vehicle even if he or she has gained access to the engine compartment or the interior ignition wires to "hot wire" the ignition.

Clarification of Requirements

In several of the proposed changes to the text of the standard, the May 1978 notice used the term "ignition system lock" instead of "key locking system" to refer to the system used to activate the engine. Lucas Industries and others pointed out that diesel, turbine and electrical engines do not have electric ignition systems. The agency will continue using the term "key locking system."

Ford recommended that the agency reword the performance requirement that the steering or forward mobility of the vehicle be impaired when the key is removed to make clear that it only applies when the vehicle is not in motion. The agency has adopted Ford's recommendation and has made the necessary clarifying changes to the standard.

Costs and Benefits

The agency has considered the economic and other impacts of this final rule and determined that this rule is not significant within the meaning of Executive Order 12221 and the Department of Transportation's policies and procedures implementing that order. The agency's assessment of the benefits and economic consequences of this final rule are contained in a final regulatory evaluation, which has been placed in the docket. Copies of that final regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this notice.

As discussed in the evaluation, the agency estimates that the final rule will add $1.51 to the cost of a passenger car and $2.06 to the cost of a truck or multipurpose passenger vehicle. The aggregate consumer cost of the final rule is $3.26 million annually for passenger cars and approximately $6.57 million annually for trucks and multipurpose passenger vehicles.

NHTSA has received complaints from consumers and businesses about vehicles in which the steering system inadvertently locked while the vehicle was in motion. Accidents occurred in several of these cases. The agency expects that the final rule will prevent such inadvertent lockup, and thus will prevent the deaths and injuries that can result.

The provisions of the final rule should also deter the joyrider thief who accounts for the majority of accidents involving stolen vehicles. Stolen vehicles are involved in approximately one out of every 350 accidents and account for an estimated 5,600 disabling injuries and 150 fatalities annually. The cost to the public from stolen vehicles is enormous, ranging from $1.8 billion to $2.8 billion annually. The agency estimates that the final rule may result in as many as 25 lives saved and 1,120 less injuries annually.

Leadtime Requirements

The final rule is effective on September 1, 1982, for passenger cars, and on September 1, 1983, for light trucks and vans. The agency believes that a two-year lead time is adequate for passenger car manufacturers because many automobiles already comply with the final rule. Other manufacturers have systems that permit activation of the steering wheel lock by simultaneously performing two actions, and thus these manufacturers need only make minor modifications to bring these systems into compliance. Manufacturers of light trucks and vans are being given three years to comply with the standard because moderate design changes are involved and such manufacturers have generally not voluntarily complied with the rule in the past.

The principal authors of this notice are Nelson Erickson, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on December 22, 1980.

Joan Claybrook
Administrator

45 FR 85450
December 29, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection

(Docket No. 1-21; Notice No. 6)

ACTION: Final rule; response to petitions for reconsideration.

SUMMARY: This notice responds to ten petitions for reconsideration concerning Safety Standard No. 114, *Theft Protection.* In response to the petitions, the agency is (1) exempting walk-in vans from the requirements of the standard; (2) exempting open-body type vehicles with readily removable or no doors from the key-in-ignition warning requirement; (3) clarifying the provision which requires a manufacturer to have 1,000 different key combinations for each type of vehicle; and (4) deleting the provision, adopted in the last notice, that is designed to prevent the driver from inadvertently locking the steering column while his or her vehicle is in motion. This notice also makes a technical amendment to the standard.

DATES: The effective date of the amendment extending the applicability of Standard No. 114 to trucks and multipurpose passenger vehicles (MPV's) having a gross vehicle weight rating of 10,000 pounds or less is September 1, 1983. This is the effective date previously established in the final rule published on December 29, 1980 (45 F.R. 85450).

SUPPLEMENTARY INFORMATION: On December 29, 1980, NHTSA published in the *Federal Register* (45 F.R. 85450) a final rule making certain amendments to Safety Standard No. 114, *Theft Protection* (49 CFR § 571.114). These amendments extended the applicability of the standard to trucks and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. The amendments also upgraded the performance requirements of the standard to prevent the driver from inadvertently locking the steering wheel while his or her vehicle is in motion.

Petitions for reconsideration were subsequently filed within the prescribed time limits by the Motor Vehicle Manufacturers Association (MVMA), BMW of North America, Inc. (BMW), American Motors Corporation (AMC), Alfa Romeo, General Motors Corporation (GM), Volkswagen of America, Inc. (VW), Fiat Motors of North America, Inc. (Fiat), Chrysler Corporation (Chrysler), Automobile Importers of America, Inc. (AIA), and Mercedes-Benz of North America, Inc. (Mercedes). In addition, Renault U.S.A., Inc., filed a comment with the agency in which it concurred in the petitions filed by VW and AIA. After evaluating these petitions, the agency has decided to modify, as fully detailed below, some of the requirements of the standard. The agency is also making a technical amendment to the standard in this notice. To the extent set forth below, the petitions are granted. Otherwise, they are denied.

Exemption for Walk-in Vans and Open-Body Type Vehicles

In general, the reaction of the petitioners to the amendments extending the standard to light trucks and vans was positive. Chrysler stated that Standard No. 114 has been effective in deterring motor vehicle theft by amateur thieves and joyriders and thus it approves of the extension. However, several petitioners asked for an exemption from all or parts of the rule for specific types of vehicles.

GM requested that walk-in vans be exempted from all of the standard's requirements. (A walk-in van is a "step-van" city delivery type of vehicle that permits a driver to enter the vehicle without stooping. Such vans are typically used to deliver lightweight, bulky merchandise such as bakery products or dry cleaning. GM describes a walk-in van as a forward control chassis which it designates as a "P truck.") GM argues that such vehicles should be exempted from the standard because there are no data to indicate a significant theft problem with these vans. Walk-in vans are exempted from the requirements of Safety Standards Nos. 203, 204, 212, and 219 because compliance with these standards "would not accomplish the safety benefits projected for passenger cars" and because these vehicles are used for low-speed city delivery service and thus are not exposed to the risk of high-speed accidents. According to GM, the lack of data indicating a theft problem provides a similar reason for exempting walk-in vans from Standard No. 114. GM notes that without the exemption, a new steering column might have to be designed, tested, tooled and manufactured for this vehicle. The petitioner suggests that the cost of such a column to purchasers could be "significant" since a low number of walk-in vans are produced.

The fact that GM might have to redesign the steering column used in these vehicles if it is forced to comply with the rule is not dispositive by itself. Compliance with any new standard or amendment to an existing rule typically requires a vehicle or equipment manufacturer to make design or tooling changes. This fact is considered by the agency in deciding whether to adopt a proposed rule or amendment.

However, the agency has decided to exempt walk-in vans from the requirements of Standard No. 114. Walk-in vans are generally commercial vehicles that have minimal capacity to accelerate and thus are not attractive to the youthful joyrider. NHTSA expects that as a result the theft rate of these vehicles is considerably less than the theft rate of other light trucks and vans. The theft rate of walk-in vans manufactured by Chevrolet and GMC supports this. The 1979 nationwide theft rate of all registered model years 1972-1980 walk-in vans manufactured by Chevrolet and GMC was one-third of the 1979 nationwide theft rate of all registered model years 1972-1980 light trucks that were built by these companies. NHTSA derived this statistic from information supplied by R.L. Polk, Inc. and National Automobile Theft Bureau. Thus NHTSA has decided to grant GM's petition and exempt walk-in vans from the requirements of the standard. However, the agency will continue to monitor the theft and accident rates of these vehicles, and will initiate rulemaking should the data indicate that application of the standard's requirements would yield a significant safety benefit.

AMC and MVMA requested that open-body type vehicles which lack a driver's door or have one that can be readily removed be exempted from the standard's key-warning requirements (paragraph S4.7 of the December 1980 final rule, renumbered S4.5 in today's rule). (An open-body type vehicle is a vehicle that has no occupant compartment top or one that can be installed or removed by the user at his or her convenience.) The petitioners argued that it is impracticable and unreasonable to require a key-warning system that is activated when the driver's door is open on a vehicle whose driver's door has been removed or on a vehicle which was produced without a driver's door. NHTSA agrees with this argument and so is amending the standard to exempt open-body type vehicles from the warning requirements. Only vehicles without doors or with readily removable ones are so exempted.

The agency notes that a seat sensor could be used to signal the presence of the key in the ignition after the driver has left the vehicle. A requirement for such a system was not within the scope of the proposal and thus could not be adopted here. NHTSA encourages manufacturers of open-body type vehicles that are exempted from the standard's warning requirements to voluntarily employ a system such as this.

Number of Key Combinations

Paragraph S4.6 of Standard No. 114 as amended in the December 1980 notice (paragraph S4.4 in today's rule) specifies the minimum number of different combinations of the key-locking systems required of a manufacturer for each vehicle type. The provision requires that manufacturers have 1,000 combinations for a type of vehicle or a number equal to the number of vehicles of that type, whichever is less. The purpose of the requirement is to ensure that each manufacturer has a sufficiently large number of key combinations so that thieves are not readily able to unlock and start vehicles through the use of master keys.

VW in its petition requested that this provision be modified. Although the petitioner does not state its position directly, it appears that VW has misinterpreted the requirement. VW implies that the provision requires a manufacturer to have, for each vehicle type, 1,000 key combinations that are not only different from each other, but also different from the key combinations used for other types of vehicles built by that manufacturer. This is not the case. Paragraph S4.6 of the standard as amended in the last notice only requires that a manufacturer who builds 1,000 or more vehicles of a particular type have at least 1,000 different key combinations. If a manufacturer builds more than one type of vehicle, it is free to use the same key combinations for two or more types of vehicles. Thus a manufacturer who builds 2,000 passenger cars and 1,100 trucks need only have 1,000 key combinations, which may be used for both the trucks and the passenger cars. The standard has been amended to clarify this point.

It is not necessary for a manufacturer to have more than 1,000 key combinations in order to achieve the objectives of the requirement. The agency finds that 1,000 different key combinations is a sufficiently high number to discourage thieves. Speed in entering and starting a vehicle is critical to successful vehicle theft. The agency finds that the key-combinations requirement will do much to slow down the efforts of thieves using master keys.

In its petition, VW complains that the phrases "for a type of vehicle" and "vehicles of that type" as they are used in paragraph S4.6 are unclear. "Vehicle type" and similar phrases have long been used by the agency typically to refer to groups of vehicles such as passenger cars and trucks. To ensure that there is no confusion in the future as to the meaning of "vehicle type," the agency is defining this phrase in the definitions paragraph (S3) of today's rule.

Inadvertent Activation

The amendments regarding inadvertent activation of the steering column lock were the most controversial of all the amendments adopted in the December 1980 final rule. These provisions (S4.3 and S4.5 of the standard as amended by that rule) were intended to prevent the driver from accidentally locking the steering system while the vehicle is in motion. For example, a panicked driver might accidentally lock the steering column in an emergency situation in which he or she turns off the engine in an attempt to stop the vehicle (such as when the vehicle suddenly accelerates due to a stuck throttle cable). The inadvertent activation provisions were intended to prevent the driver from locking the steering column in a situation such as this by requiring him or her to perform a series of separate and distinct acts in order to activate the locking system.

In the preamble to the December 1980 final rule, the agency described two currently used locking systems that meet the agency's objectives. In one system, found in many vehicles equipped with an automatic transmission and a column-mounted transmission shifter, the shifter must be moved into "park" or "reverse" before the steering lock is engaged. The other system requires the driver to push a key release lever or button and move the key into the "lock" position in order to activate the lock. This system is effective only if the button is located in a position such that the driver must use both hands to operate the system (henceforth referred to as the two-hand button system). The system does not comply with the agency's intent if the button or lever is positioned such that the driver can push the key-release mechanism and simultaneously turn the key to "lock" using only one hand (henceforth referred to as the one-hand button system).

Mercedes, VW and Chrysler agreed that there is a need to prevent drivers from accidentally locking up the steering column of a moving vehicle. However, these and many other petitioners objected to the particular provisions regarding inadvertent activation that were finally adopted by the agency. The petitioners saw various problems with the amendments.

One basic problem raised by many petitioners was an inconsistency between S4.5 and the intent of the agency as expressed in the preamble to the December 1980 final rule. In the preamble, NHTSA rejected the Economic Commission for Europe (ECE) anti-theft regulation. The agency thereby implicitly rejected those locking systems which are activated by the removal of the key and which permit the key to be removed without the driver's first having to operate a button or lever (henceforth referred to as buttonless systems). However, paragraph S4.5 of the final rule can be interpreted to permit the use of these systems.

Virtually all the petitioners complained that the agency failed to demonstrate a safety need for the inadvertent activation requirements as described in the December 1980 preamble. Alfa Romeo, BMW, VW, and Mercedes all stated that they have employed locking systems that comply with the ECE regulation for many years and have never received any report of an accident or fatality resulting from the inadvertent activation of a lock on a moving vehicle. GM similarly stated that it knows of only five incidents of accidental lock-up among the more than five million vehicles sold in the past 10 years that are equipped with a one-hand button system.

Many petitioners argued that even if there were a safety need for the new requirements, these requirements as proposed in the preamble to the final rule may fail to achieve the benefits anticipated by the agency. They suggested that some people might find a two-hand button system (the cheapest available alternative that complies with the new requirements) so inconvenient that they will leave their keys in the vehicle when making short stops and thus leave their cars more vulnerable to theft. A two-hand button system may be difficult, painful, or impossible for handicapped or arthritis-ridden people to use. These individuals might be similarly inclined to leave their keys in the ignition. Finally, some drivers might develop a reflex action with a two-hand button system, just as they have done so with buttonless and one-hand button systems.

Several manufacturers alleged that compliance with the inadvertent activation requirements as described in the December 1980 preamble will necessitate major design and tooling changes. Mercedes and VW stated that they will have to modify not only the steering column but also the instrument panel if they are forced to comply with the new provisions. Three foreign manufacturers suggested that the agency's rejection of the ECE regulation is not in line with current attempts to harmonize Federal motor vehicle safety standards with automotive standards of other countries.

AMC and AIA complained of lack of notice. They argued that although the general issue of inadvertent activation of the steering column lock was discussed in the NPRM, the notice did not mention the idea of requiring drivers to perform an additional mechanical action in order to activate the steering column lock.

After careful consideration of all arguments raised by the petitioners and further study of the consumer complaints received about inadvertent activation of the steering column lock in moving vehicles, NHTSA has decided to delete the amendments regarding inadvertent activation that were adopted in the December 1980 notice. The agency disagrees with those petitioners who contend that inadvertent activation is not a safety problem in those vehicles equipped with buttonless or one-hand button systems. Consumer complaints received by NHTSA illustrate that drivers may accidentally lock the steering column in attempting to stop the vehicle in an emergency situation. These complaints have been placed in the public docket and are available for public inspection. However, upon further study the agency has determined that the problem of inadvertent activation is not significant enough to require vehicles to be equipped with key-locking systems that provide better protection against inadvertent activation. As a result, NHTSA has decided to delete paragraphs S4.3 and S4.5 from the final rule as amended in the last notice.

The agency will continue to monitor complaints on inadvertent activation of the steering column lock while the vehicle is in motion and will initiate rulemaking should the data so warrant. NHTSA encourages manufacturers to voluntarily install key-locking systems that provide improved protection against inadvertent activation on their vehicles.

All the petitioners who expressed dissatisfaction with the new requirements regarding inadvertent activation requested that the effective date be delayed for one year or more. Since the provisions on inadvertent activation were the only new requirements for passenger cars, this issue is now moot. BMW also requested that manufacturers of trucks and MPV's be given an additional year of leadtime to comply not only with the new provisions on inadvertent activation but also with the rest of the standard's requirements. BMW never stated that it could not comply with the earlier effective date. More importantly, BMW's request was premised on the assumption that the agency would not rescind the new requirements on inadvertent activation. As noted above, NHTSA has decided to delete those requirements. Accordingly, BMW's request is denied.

Technical Amendment

In the preamble to the final rule, NHTSA stated that it was limiting the extension of Standard No. 114 to MPV's having a GVWR of 10,000 pounds or less. MVMA pointed out in its petition that the application section, S2, of the rule does not make this limitation clear. The agency agrees and is modifying the section accordingly.

Costs and Benefits

NHTSA has considered the economic and other impacts of these amendments and has determined that the rule is not a major rule within the meaning of Executive Order No. 12291. The agency has further determined that the amendments are not significant within the meaning of the Department of Transportation regulatory procedures. In issuing the final rule of December 29, 1980, NHTSA prepared a Final Regulatory Evaluation, which contains the agency's assessment of the benefits and economic consequences of that rule. Copies of the evaluation can be obtained by writing NHTSA's Docket Section at the address given at the beginning of this notice.

The agency believes that additional analysis of the costs and benefits of today's amendments is not necessary in light of the estimates made in the December 1980 Regulatory Evaluation. In that evaluation, NHTSA estimated that compliance with Standard No. 114 would add $2.06 to the cost of a truck or MPV. The aggregate consumer cost would be approximately $6.57 million each year. These figures assumed that truck and MPV manufacturers would use a two-hand button system to comply with the new provisions on inadvertent activation. The agency anticipated that such a system would be the cheapest way for manufacturers to comply with the standard. The new provisions regarding inadvertent activation are rescinded in today's amendments. However, the agency believes that these figures are still a reasonable estimate of the cost of extending Standard No. 114 to light trucks and vans. This is because NHTSA anticipates that some trucks and MPV manufacturers will choose to comply with the locking provisions by installing a two- or one-hand button system, even though a buttonless system would suffice and would appear to be cheaper. A manufacturer that already uses one- or two-hand button systems in its passenger cars and can easily install the same systems in its light trucks and vans might find this alternative to be the cheapest way to comply with Standard No. 114. Thus NHTSA estimates that extension of Standard No. 114 to light trucks and vans will cost the consumer $2.06 per vehicle. The cost to the consumer will be less to the extent that truck and MPV manufacturers comply with the rule's requirements by using buttonless systems.

The agency has also analyzed these amendments for purposes of the National Environmental Policy Act and has determined that it will not have a significant effect on the human environment.

Although NHTSA has considered the effects of these amendments on small businesses, the agency has not prepared a regulatory flexibility analysis. Such an analysis is not necessary in this case, since the Regulatory Flexibility Act applies only to rules for which an NPRM is issued on or after January 1, 1981. The notice proposing the changes in Standard No. 114 that culminated in the amendments adopted today was issued on April 26, 1978 (43 F.R. 18577, May 1, 1978).

Issued on June 17, 1981.

Raymond A. Peck, Jr.
Administrator
46 F.R. 32251
June 22, 1981

MOTOR VEHICLE SAFETY STANDARD NO. 114

Theft Protection—Passenger Cars

(Docket No. 1-21; Notice 5)

S1. Purpose and scope. This standard specifies requirements for theft protection to reduce the incidence of accidents resulting from unauthorized use.

S2. Application. [This standard applies to passenger cars and to trucks and multipurpose passenger vehicles having a GVWR of 10,000 pounds or less. (46 F.R. 32251—June 22, 1981. Effective: 9/1/83)]

S3. Definitions. "Combination" means one of the specifically planned and constructed variations of a locking system which, when properly actuated, permits operation of the locking system.

"Key" includes any other device designed and constructed to provide a method for operating a locking system which is designed and constructed to be operated by that device.

["Vehicle type" refers to "passenger car," "truck," or "multipurpose passenger vehicle," as those terms are defined in 49 CFR § 571.3. (46 F.R. 32251—June 22, 1981. Effective: 9/1/83)]

S4. Requirements.

[S4.1. Each truck and multipurpose passenger vehicle having a GVWR of 10,000 pounds or less manufactured on or after September 1, 1983 and each passenger car shall meet the requirements of S4.2, S4.3, S4.4, and S4.5. However, open-body type vehicles that are manufactured for operation without doors and that either have no doors or have doors that are designed to be easily attached to and removed from the vehicle by the vehicle owner are not required to comply with S4.5. (46 F.R. 32251; June 22, 1981. Effective: 9/1/83)]

S4.1.1. Passenger cars manufactured before September 1, 1982, shall meet the requirements of S4.2, S4.4, S4.6, and S4.7 or the requirements listed in S4.1.2.

S4.1.2. Passenger cars manufactured on or after September 1, 1982, shall meet the requirements of S4.3, S4.5, S4.6, and S4.7.

S4.1.3. Trucks and multipurpose passenger vehicles having a GVWR of 10,000 pounds or less manufactured on or after September 1, 1983, shall meet requirements of S4.3, S4.5, S4.6, and S4.7.

S4.2 Each vehicle shall have a key-locking system that, whenever the key is removed, will prevent—

(a) Normal activation of the vehicle's engine or other main source of motive power; and

(b) Either steering or forward self-mobility of the vehicle, or both.

S4.3. [The prime means for deactivating the vehicle's engine or other main source of motive power shall not activate the deterrent required by S4.2(b).

S4.4 For each vehicle type manufactured by a manufacturer, the number of different combinations of the key-locking systems required by S4.2 shall be at least 1,000, or a number equal to the number of vehicles of that type manufactured by such manufacturer, whichever is less. The same combinations may be used for more than one vehicle type.

S4.5 A warning to the driver shall be activated whenever the key required by S4.2 has been left in the locking system and the driver's door is opened. The warning to the driver need not operate—

(a) After the key has been manually withdrawn to a position from which it may not be turned;

(b) When the key-locking system is in the "on" or "start" position; or

(c) After the key has been inserted in the locking system and before it has been turned on. (46 F.R. 32251; June 22, 1981. Effective: 6/22/81)]

S4.6 The number of different combinations of the key-locking systems required of each manufacturer for a type of vehicle shall be at least 1,000, or a number equal to the number of vehicles of that type manufactured by such manufacturer, whichever is less.

S4.7 A warning to the driver shall be activated whenever the key required by S4.2 or S4.3 has been left in the locking system and the driver's door is opened. The warning to the driver need not operate—

(a) After the key has been manually withdrawn to a position from which it may not be turned;

(b) When the key-locking system is in the "on" or "start" position; or

(c) After the key has been inserted in the locking system and before it has been turned.

(Sec. 103, 113, 119, Pub. L. 89—563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.50)

Issued on December 22, 1980.

Joan Claybrook,
Administrator

45 F.R. 85450
December 29, 1980

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 115

Vehicle Identification Number—Passenger Cars

(Docket No. 1–22)

A proposal to amend section 371.21 of Part 371, Federal Motor Vehicle Safety Standards, by adding a new standard, Vehicle Identification Number—Passenger Cars, was published in the *Federal Register* on December 28, 1967 (32 F.R. 20886).

Interested persons have been afforded an opportunity to participate in the making of the standard. Their comments and other available information have been carefully considered.

The Administrator has concluded that prevention and deterrence of passenger car thefts would substantially reduce the number and seriousness of motor vehicle accidents. Available evidence shows that cars operated by unauthorized persons are far more likely to cause unreasonable risk of accidents, personal injuries and deaths than those which are driven by, or with the permission of, their owners. The incidence of theft and the risk of accidents attributable thereto is increasing. According to a recent study by the Department of Justice, an estimated 94,000 stolen cars were involved in accidents in 1966, and more than 18,000 of these accidents resulted in injury to one or more people. 18.2 percent of the stolen cars became involved in accidents, and 19.6 percent of the stolen-car accidents caused personal injury. The same study predicted that automobile thefts in 1967 would total about 650,000; about 100,000 of these stolen cars would be expected to become involved in accidents. Comparing these figures with statistics for cars which are not stolen, the approximate accident rate for stolen cars would be some 200 times the rate for other cars. Thus, a reduction in the invidence of auto theft would meet the need for motor vehicle safety. It would not only reduce the number of injuries and deaths among those who steal cars, it would also protect the many innocent members of the public who are killed and injured by stolen cars each year.

In its report, "The Challenge of Crime in a Free Society," the President's Commission on Law Enforcement and Administration of Justice noted the rising cost of auto thefts in lives and dollars, highlighted the need for measures to reduce auto thefts and suggested that "The responsibility could well be assigned to the National Highway Safety Agency as part of its program to establish safety standards for automobiles." (pp. 260–261).

The Administrator has decided that the problem of reducing the incidence of automobile thefts should be attacked on a two-pronged basis. On one hand, physical impediments should be placed in the path of potential thieves; to accomplish this, a Motor Vehicle Safety Standard on Theft Protection—Passenger Cars has been promulgated. That standard prescribes automobile equipment which tends physically to defeat an attempted theft. It is equally important to interpose psychological deterrents to automobile theft. A unique identification number affixed to each car in a uniform location and readable from outside the car would serve as such a deterrent. The present standard requires manufacturers to install such a number in each passenger car. When so installed, it will enable law enforcement agencies to find stolen cars and apprehend car thieves with much greater facility than now exists. By confronting a potential thief with the promise of swift and sure apprehension, compliance with the standard will deter him from making off with someone else's automobile. All law enforcement agencies, as well as many other organizations concerned with the rising incidence of car thefts, that responded to the Notice of Proposed Rule Making endorsed the concept of a visible identification number embodied in the standard. Many of these groups said that the standard would promote efforts to curb unauthorized use of passenger cars. The Administrator has therefore concluded that issuance of the standard will protect the public against the unreasonable risk of accidents stemming from widespread automobile theft.

The Administrator has carefully considered the contention, which some manufacturers advanced, that the standard might actually increase the risk of automobile theft because a thief, armed with ready access to the car's identification number, might thereby obtain a key for its ignition lock. The acquisition of master or identical keys procured through knowledge of a vehicle's identification number is a lengthy and arduous process. Hence, it is a technique that is rarely, if ever, used by amateur thieves whose activities create the greatest risk of stolen-car accidents. Furthermore, as a practical matter, it is possible to utilize this technique only with respect to a relatively small number of cars. The Theft Protection standard, effective January 1, 1970, will result in a larger number of combinations for ignition locks, and this should substantially reduce the effectiveness of master keys. In addition, improved key-control measures can prevent thieves from acquiring duplicate keys simply by knowing the vehicle identification number. On balance, therefore, the Administrator does not agree with those who argue that the standard will not result in an overall reduction in the number of automobile thefts.

The Administrator also rejects the contention that the standard is unnecessary because of the almost universal requirement that all automobiles must bear at least one license plate. Experience has shown that ordinary license plates, located on the outside of a car and installed with screws, are often removed and replaced with other plates. Knowing only the number of the license plates sold to the owner of the stolen car, the police have no sure way of identifying the car when other plates have been attached to it. The standard attempts to overcome this problem by requiring that the car's identification number be affixed with relative permanency.

In addition to license-plate requirements, the laws of many states contain provisions relating to identifying numbers on motor vehicles. The primary purpose of these state-law requirements is to facilitate the issuance and transfer of titles to motor vehicles. So far as the Administrator is aware, no state provides for a number which is readable from outside a vehicle without opening a door, hood or other part of the vehicle. These state requirements are neither safety standards, nor do they relate directly to the prevention of motor vehicle thefts or the apprehension of thieves. Consequently, the Administrator has concluded that the standard will have no preemptive effect upon such state laws.

Several changes have been made in the form of the standard as it appeared in the Notice of Proposed Rule Making. A number of comments objected to the requirement, as stated in the Notice, that the vehicle identification number must "provide permanent legibility" on the ground that it was unrealistic and unattainable. In response to these comments, the requirement was deleted. The term "permanent structure" was defined to clarify its meaning, in the light of a number of submissions which indicated that some manufacturers were confused about the parts of the automobile that were included within the meaning of the term.

Some comments questioned the requirement that the number must be affixed in such a manner that "removal, replacement, or alteration of the number will show evidence of tampering." The requirement has been deleted. The standard now provides that the number must either be sunk into or embossed upon each car's permanent structure or upon a separate plate that is permanently affixed to the permanent structure. The term "permanently affixed" is used in section 114 of the National Traffic and Motor Vehicle Safety Act, and it was retained in the standard notwithstanding contentions that it was not sufficiently definitive.

The portion of the Notice pertaining to readability of the number (paragraph S4.4) was amended to include the conditions under which the number must be readable. This provision was also redrafted to make it clear that the number must be readable from a position outside the vehicle without moving any part of the vehicle. This precludes placing the number in a location such that, in order to read it, a door, trunk lid or other portion of the car's body must be opened.

In consideration of the foregoing, section 371.21 of Part 371, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 115 . . . effective January 1, 1969.

This amendment is made under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority of April 24, 1968.

Issued in Washington, D.C., on July 3, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 10207
July 17, 1968

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 115

(Docket No. 1–22; Notice 5)

This notice amends Standard No. 115, Vehicle Identification Number (VIN), to extend its applicability to additional classes of motor vehicles and to specify its content and format. The action was undertaken because of the increased use of vehicle identification numbers by the safety community, and is intended to extend and simplify VIN use.

Effective date: January 1, 1980, for passenger cars; September 1, 1980, for other vehicles.

For further information contact:

Mr. Nelson Erickson, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202/426–0854).

Supplementary information:

On January 16, 1978, the National Highway Traffic Safety Administration (NHTSA) published a notice of proposed rulemaking (43 F.R. 2189) which proposed extending the applicability of Federal Motor Vehicle Safety Standard No. 115 dealing with vehicle identification numbers (49 CFR 571.115) to additional classes of vehicles and specifying VIN format and content for specific classes of vehicles.

The uses and users of the vehicle identification number were discussed in detail in the previous notice. In summary, the VIN is used as the key identifier of a vehicle by motor vehicle administrators, manufacturers, insurance companies, law enforcement agencies, and the NHTSA, and is the cornerstone of the safety defect recall program. Also discussed in the previous notice were the long-standing efforts by several groups in the United States and abroad to standardize the VIN format and content and the two major and incompatible VIN systems previously proposed by the International Standards Organization and the Vehicle Equipment Safety Commission.

The system developed by the International Standards Organization (ISO), with the participation of United States representatives from industry and government, consists of 17 characters and is flexible in terms of content. A second system developed by the Vehicle Equipment Safety Commission (VESC), working in conjunction with the American Association of Motor Vehicle Administrators (AAMVA), consists of 16 characters whose characteristics are rigidly defined. While the Motor Vehicle Manufacturers Association (MVMA) attempted to establish a compromise position between the ISO and VESC-AAMVA systems by letter to Commissioner C. B. Craig of California (a copy of which was submitted to the docket), neither party appears to have been persuaded to alter their system and both continue to urge that the jurisdictions they serve and the NHTSA adopt their system.

By issuing a proposal which the NHTSA believed was a first step in establishing a better-engineered, more flexible system serving all users to the greatest degree possible, the agency hoped to elicit comments which would aid it in this endeavor. While some comments merely recited their belief that either the ISO or the VESC-AAMVA system should be adopted in toto, most were helpful in their analysis of the NHTSA proposal. All comments were carefully considered.

The NHTSA concludes it should not change its previous position that neither the ISO nor the VESC-AAMVA systems are sufficient to satisfy the broadest group of potential users of the VIN in the most efficient fashion. In the case of the ISO system, the legitimate needs of the motor vehicle administrators for descriptive information concerning the vehicle identified were not met. It should be pointed out the ISO system was never meant to serve this need, but merely to identify the vehicle. The VESC-AAMVA systems, on the other hand, while admirably suited to the needs of the States did not take into account fully the needs of the manufacturers and of NHTSA. The most significant comments concerning the NHTSA proposal are discussed below.

Preemption

A threshold question discussed in the notice of proposed rulemaking (NPRM), but raised again by the comments, related to the preemptive effect of the NHTSA standard on non-identical State standards relating to the same aspect of performance (see § 103(d) of the National Highway Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392(d)). This issue was most comprehensively discussed by the Maryland Department of Transportation, which raised two basic points.

First, Maryland called the attention of the agency to the preamble of the notice, which originally established Federal Motor Vehicle Safety Standard No. 115 (33 F.R. 10207). As originally established in 1968, the standard did not specify requirements regarding either the content or the format of the VIN. In that notice, the Administrator stated that State laws relating to identifying numbers used for titling purposes did not conflict with the standard as then drafted and therefore were not preempted.

The question, however, is not whether Standard No. 115 as originally issued 10 years ago preempted State standards, but whether the expanded standard regarding VIN format and content being promulgated today preempts the States in regulating this aspect of the VIN. As stated in the Advance Notice of Proposed Rulemaking (41 F.R. 38189) and the NPRM, and as reiterated here, it is the agency's view that Standard No. 115 as promulgated by this notice fully occupies the area of VIN format and content and preempts State and local requirements relating to the same matter.

The second legal argument raised by Maryland is that by establishing the format and content of the VIN, the NHTSA is "unabashedly violating fundamental constitutional principles of federalism." The gist of Maryland's argument, as we understand it, is that establishing the content and format of the VIN makes it necessary for the States to purchase computers and record keeping equipment and thereby makes them "quasi-departments and instrumentalities" of the NHTSA. In support of their position, they cite *National League of Cities v. Usery*, 426 U.S. 833, 96 S.Ct. 2465, 49 L. Ed. 2d. 245 (1976).

The NHTSA finds no merit in this argument. *National League of Cities v. Usery* concerned the direct imposition of Federal minimum wage standards by Congress on the States with an additional cost of millions of dollars in State employee salaries and an effect which curtailed the ability of the States to carry on a number of their essential functions. The result of the implementation of Standard No. 115 has no greater effect on the States than do any of the other Federal safety standards which prescribe minimum performance standards for and affect the cost of vehicles which the States purchase. Further, there is no indication in the docket that the VIN format and content established by this notice, as compared to that contained in the VESC-AAMVA system, will have a substantial effect on the States or, as put in *Fry v. United States*, 421 U.S. 542, 95 S.Ct. 1792, 44 L. Ed. 2d 363 (1975), impair their "ability to function effectively in a federal system."

A final argument relating to the preemption issue which was raised in some comments is that the NHTSA has failed to consult with the VESC, as required by § 103(f)(2) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392(f)(2)) and therefore the issuance of a revised Standard No. 115 is invalid. The plain words of the statute and the legislative history of the Act show clearly that the process contemplated was advising the VESC of NHTSA proposals by issuing them and receiving the VESC comments. In this instance, comments were received from the VESC and carefully considered.

International Harmonization

An important issue raised by most foreign manufacturers, the U.S. Department of Commerce, and the President's Special Representative for Trade Negotiations, Ambassador Robert S. Strauss, was the incompatibility of the NHTSA proposal with the international standard adopted by the International Standards Organization and, subsequently, by the European Economic Community. This issue was raised not only in relation to the goal of international harmonization of national standards, but also to the need to avoid the creation of unnecessary international obstacles to trade. In this regard, Mr. Strauss noted that a proposed Code of Conduct on Preventing Technical Barriers to Trade was under negotiation in the multilateral trade negotiations. This code would encourage adherents to use relevant international standards as the basis for national standards, except where their use would be inappropriate.

The NHTSA, as a rule, establishes its motor vehicle safety standards outside the channels of multilateral negotiations. NHTSA does recognize, however, the desirability and importance of fostering international cooperation wherever feasible and unfailingly regulates all manufacturers, be they domestic or foreign, in the same equitable fashion. Indeed, it was in this spirit that the NHTSA participated in the meetings which led to the creation of a number of ISO standards and proposals, including the one for the ISO VIN system.

However, through comments received during the rulemaking process, the NHTSA has become aware of the significantly greater potential of the VIN than is realized under the ISO system, both in terms of the amount of information which it can contain and its utility to various users. The efforts of the parties creating the VESC-AAMVA system and the ISO system, as well as their frank and forthright comments concerning the NHTSA proposals, have established clearly the parameters of VIN usefulness and the needs of the users.

Consequently, in developing a VIN format and content which allows it to be used in the most efficient fashion—a goal which all parties agree to—the agency believes it is establishing a VIN system whose merit can and will be recognized by all. Of key importance to the agency in this belief are two facts. First, the VIN format as adopted by the ISO. Further, it is in almost all ways compatible with the VESC-AAMVA system.

The first section of the NHTSA VIN which serves as a maker identifier is fully compatible with the systems proposed by the VESC-AAMVA and the ISO. Likewise the third section of the NHTSA VIN which serves as a vehicle indicator is fully compatible with the systems proposed by the VESC-AAMVA and the ISO. The second section of the NHTSA VIN, which serves as a vehicle description, is somewhat different in structure than that contained in the other two systems. However, it meets the informational needs of the VESC-AAMVA, while allowing the manufacturers the flexibility afforded by the ISO system coupled with the format which the ISO adopted.

Secondly, the ISO system, while adopted in Europe, has yet to be implemented by the manufacturers. The NHTSA sincerely hopes that the ISO, after considering the slight variations to its systems adopted by the agency, will modify its system to make it consistent with the NHTSA rule. In this way, international harmonization can be assured.

Information Coding and Retrieval Techniques

A short discussion of information coding and retrieval techniques will be helpful in understanding the VIN standard.

Information may be directly obtained from a series of alpha and numeric characters. For example, "FORD" indicates the name of an automobile manufacturer without further translation. The same manufacturer may also be represented by a single character, such as "F," but that character must be deciphered to determine whether it represents Ford, Fiat, or some other manufacturer. This process is called coding and decoding.

To decode a character, a "table look up" process is used. The dictionary may be either a reference document or a computer. In both instances, the character "F" will be assigned a meaning in the table, such as "F" means Ford, and looking up either "F" or Ford will allow its meaning to be determined.

The character "F" may represent more than one piece of information, however, even though it is a single character. It can represent the name of a manufacturer, e.g., Ford, the model of a vehicle produced by Ford, e.g., Pinto, and any other characteristics which the vehicle coded "F" has. This process is similar to a social security number which can be used as a key to a considerable amount of information about the individual to whom that number is assigned.

As a practical matter, this means that a manufacturer can encode more than five pieces of information in a five-character code word. For example, if all 1980 Chevrolet Chevelle, Malibu, Estate Station Wagons were in the same weight class and contained the same restraint system, there would be no need to directly encode this information.

If a one-character alpha/numeric coding system is used, there can only be 35 different unique codes (A-Z, 1–9). For example, if the social security number consisted of only one character, only 35 individuals could be identified. Therefore, to increase the number of possible codes, more than one-character is used. If two-characters are used, there are 1225 possible codes; if three-characters are used, there are 42,875 possible codes; if four-characters are used, there are 1,500,625 possible codes; and if five-characters are used, there are 52,521,875 possible codes. The number of possible code increases exponentially as the number of characters within the code increases.

Purpose and Scope

Several comments to the docket questioned whether the standard would be helpful in simplifying vehicle certification. While the presence of a VIN on the certification label uniquely identifies the vehicle being certified and avoids the need for considerable additional identifying information concerning that vehicle, it is a secondary purpose and has therefore been eliminated as a rationale for promulgation of the standard from the Purpose and Scope section.

Application

The Truck Trailer Manufacturers Association and a number of individual trailer manufacturers strongly opposed the inclusion of truck trailers within the requirements of Standard No. 115. In support of their position, they pointed to the small size of many trailer manufacturers and their lack of access to sophisticated computer equipment. They also pointed to the lack of data relating to a serious safety problem involving trailer theft. Finally, they pointed to the overall government desire to reduce the regulatory burden on businesses.

The NHTSA considered carefully the issues raised by the trailer manufacturers. It concluded that the need for a unified VIN system outweighed the argument of these manufacturers. If States and other users, as well as recall campaigns, are going to establish computer capacity based on a 16-character plus check digit VIN system, allowing a different system will create substantial confusion and perhaps the loss of trailer VINs within the data base because of their aberrant format. Further, the use of a standardized VIN format will allow for the effective tracing of trailers for accident investigation purposes and the use of hidden partial VINs as a law enforcement tool.

In order to deal with the real problems facing the small manufacturer, however, much of the data proposed to be required of the trailer manufacturers has been eliminated. To the extent a limited number of models are produced, the necessary information can be simply represented. The first three characters would represent the maker identifier. The next five characters indicates the model in whatever fashion the manufacturer chooses. Thus, four of these characters could be standardized and only the fifth would be variable if only a limited number of models are made. The derivation of the next character, the check digit, is easily dealt with by the use of an inexpensive, hand-held calculator. The representation of the plant and model year could also be standardized. The determination of the trailer's production sequence, particularly with a small annual output, should not be difficult. The information which is unique to a vehicle can be added to its VIN when the certification label is prepared.

A definition of "manufacturer" has been added to make clear that the final stage manufacturer is responsible for assigning and affixing the VIN.

Based on the suggestion of the Motor Vehicle Manufacturers Association, the term "type" has been substituted for the term "class," but the definition remains the same.

The definition of "model year" is altered to limit the actual period of a model year to just under two calendar years. The NHTSA concludes this will deal with the problem of multiyear model years raised by the AAMVA comment.

Requirements

Several of the commenters expressed the view that affixing a tamperproof label which could not be removed intact was a better method of displaying the VIN than stamping it on a separate plate which was affixed to the vehicle. The language of S4.3 is amended to indicate this is permissible. Volvo commented that the phrase "sunk into or embossed" was technically limiting, and the language is therefore broadened to read "appear clearly and indelibly." The agency also wishes to call to the attention of the manufacturers selecting the option providing for a separate plate that whether or not a plate is "permanently affixed" is a matter which the agency intends to examine carefully.

Legibility Requirements

Many manufacturers commented unfavorably on the comprehensive legibility and positioning requirements of the VIN, stating they were design restrictive and unnecessary. In support of their position, they also pointed to increased retooling expenses and an increase in the size of the VIN plate if the requirements were adopted.

Consequently, the NHTSA concludes that it will limit its legibility requirements to the minimum necessary to ensure an accurate reading of the VIN. These specify a minimum character height of 4 mm and that only capital, sans serif characters appearing on a contrasting background shall be used. If future data indicates these requirements are not sufficient, they will be strengthened. S4.3.1 and S4.5 are therefore substantially amended and S4.4.1 is deleted.

Section I—MAKER IDENTIFIER

The use of the first three characters of the VIN to uniquely identify the manufacturer, make and type (previously designated "class") of the motor vehicle if the manufacturer produces 500 or more vehicles of its class annually is retained as proposed. The use of the first three characters of the VIN and the first three characters of the segment of the VIN which indicates the production sequence of the vehicle to identify manufacturers of less than 500 vehicles in a class annually is also retained.

The AAMVA comment in relation to the maker identifier requirement was that motor vehicle administrators register vehicles by make, never by manufacturer. Consequently, the requirement was said to be "totally redundant." Foreign manufacturers, on the other hand, point out that a make classification is essentially a United States phenomenon, and is therefore not important. However, under the NHTSA proposal neither manufacturer nor make is directly represented in the identifier. If State motor vehicle administrators are concerned only with a vehicle make, they need only program their data processing equipment to derive the make from the three-character identifier code. If foreign manufacturers do not utilize the make designation, then they need only advise the NHTSA of this fact when they submit information to the agency relating to the meaning of their identifier.

The Society of Automotive Engineers (SAE) pointed out its work in the area of manufacturer identification and volunteered to be the repository and assignor of maker identifiers. The NHTSA must accept, of course, the ultimate responsibility concerning maker identifiers. The standard provides, however, that an agent of a manufacturer can submit the maker identifier. The NHTSA would welcome the SAE carrying out these responsibilities as the agent of manufacturers, thus avoiding the potential confusion and initial duplication forecasted by many comments.

Section II—VEHICLE ATTRIBUTES

Section II of the VIN, relating to vehicle attributes, caused the most confusion among those commenting. The AAMVA and VESC strongly opposed the NHTSA vehicle attributes section proposal, although the differences between the VESC-AAMVA system and the NHTSA system were minimal.

Under the VESC system, there would be five characters in the vehicle attribute section. The first four characters would be a "code word" from which a vehicle's line, series, and body type could be deciphered and the fifth would be a second "code word" decipherable into the engine type. Under the NHTSA proposal, the vehicle attribute section would have consisted of six characters representing a "code word" from which the information required by the VESC as well as additional information the NHTSA believed was important could be deciphered. Thus, the difference between the VESC and NHTSA resolved itself into the amount of information contained and the use of two code words versus one code word.

While many commenters recommended the use of the VESC system because of its fixed-length, fixed-field format, in the second section, both systems were of a fixed length and, except for a specific position to represent engine type, both had the same degree of a fixed field.

After a review of the comments, the NHTSA has determined that all of the information proposed to be required is not necessary at this time as discussed below. Consequently, only five characters are needed in the vehicle attributes section to allow for an adequate number of code words to represent the required information. Because of this change the designation of the plant of manufacture has been moved to the third section as is discussed below. Further, the sixth character of this section has been replaced by the check digit as is also discussed below.

It would be useful at this time to review the NHTSA requirements for the vehicle attribute section promulgated in this notice as compared with the VESC-AAMVA and ISO systems.

A typical NHTSA vehicle attribute section for a passenger car would appear as follows: RX6302

The first five characters would be a code word from which is deciphered the line, series, body type, engine type, weight class, and restraint type. The sixth character would be the check digit. It should be noted that the check digit need not be stored in a computer memory bank, as it can be regenerated during printout.

A typical VESC-AAMVA vehicle attribute section for a passenger car would appear as follows: RX63D

The first four characters would be a code word from which is deciphered the line, series and body type. The fifth character would be a code word decipherable into the engine type.

A typical ISO vehicle attribute section for a passenger car would appear as follows: RX63D2

All six characters would be decipherable into a series of discretionary vehicle attributes.

Informational Requirements

Many commenters indicated that they believed much of the information required by the agency to be decipherable from the vehicle attribute section was not necessary. After a review of the comments, the NHTSA has determined to require for passenger cars only that information required by the VESC-AAMVA system and information relating to weight class and occupant restraint type. Information requirements for the other type of vehicles are also reduced.

Several comments pointed out that only the final stage manufacturer would be able to assign the VIN as the vehicle's characteristics would not be known until that time. The comments also pointed out this raised a problem when a defect campaign was required of a first and second stage manufacturer. To ease this problem, the NHTSA has concluded that the identity of any previous manufacturers should be decipherable from the vehicle attribute section. This procedure has been developed by the Society of Automotive Engineers for their recommended practice for motor home vehicle identification numbers. The agency also assumes that manufacturers will keep sufficient records pursuant to their responsibilities under the National Traffic and Motor Vehicle Safety Act to trace incompleted vehicles sold to final stage manufacturers.

Because of the flexibility afforded by the five-character vehicle attribute section, further information could be required in the future without any change in the VIN format as established by this rule.

Section III—VEHICLE IDENTIFIER

Model Year

The NPRM proposed that either a vehicle's model year or the calendar year of manufacture be encoded in the first character of the vehicle identifier section. Many comments suggested this would be confusing, and that only model year should be encoded as this is the most representative category. The NHTSA concurs in this view, and S4.5.3.1 is amended accordingly. While one comment suggested including a direct two-digit code representing the last two numbers of the year, the NHTSA concludes that there is not sufficient space in the VIN to include two characters as a year identifier.

Plant of Manufacture

Numerous comments were made relating to what was perceived as optional identification of the plant of manufacture in the NHTSA proposal. As the proposal stated, however, the plant of manufacture was required to be identifiable either directly from the last character of the vehicle attribute section or indirectly from the entire VIN. At no time was the inclusion of the plant of manufacture made optional.

After reviewing the comments to the docket from the manufacturers, however, the NHTSA has concluded that the added flexibility of allowing the plant to be derived from the entire VIN rather than a specific character is not necessary, and that the more traditional approach as embodied in the VESC-AAMVA and the ISO systems should be established. Consequently, plant of manufacture is not required to be designated in the second character of the third section (vehicle attribute section).

Production Sequence Number

The NPRM proposed that the last six characters represent the sequential number of a vehicle when the manufacturer produced more than 500 vehicles annually of that type. The Truck Trailer Manufacturers Association stated that some of their members might desire to keep secret for competitive purposes the number of vehicles they produce annually. Since a manufacturer may begin his sequence at any number, however, so long as the order thereafter is maintained in sequence, the actual number of vehicles produced can be kept secret.

A number of comments pointed out that for various reasons a vehicle might be taken from a production line, thereby having an actual sequential number which differs from the production sequence number originally assigned by the manufacturer. The proposal is amended to indicate that the production sequence number is required. Other comments questioned how the system could deal with manufacturers who produced less than 500 vehicles in a class one year and more than 500 in the next. It should be noted that occasional overruns can be accommodated up to a total of 999 vehicles annually without the assignment of a different manufacturer identifier.

Check Digit

The requirement for a check digit is retained as proposed, but the check digit itself is repositioned within the VIN. Many commenters stated that the system proposed by the VESC-AAMVA, utilizing a computer "edit routine" as well, designating many characters as either alpha or numeric, would be more efficient in reducing errors.

Both the check digit and the edit routine procedures are designed to reduce errors. The edit routine process analyzes the VIN in two areas. First, it considers the basic format utilized by a manufacturer, thereby discovering format errors. Secondly, it considers whether characters which should be either alpha or numeric meet these requirements. Thus, the edit routine can pinpoint with some accuracy where certain errors occur in a VIN.

The check digit routine, however, is able to discover errors missed by the edit routine process, such as mistaken characters of the same type (alpha or numeric). The check digit when used in conjunction with an edit routine can find a greater proportion of errors than can be found using the basic edit routine proposed by some commenters. Further, the check digit, unlike the edit routine which needs substantial data processing capability to be utilized, can be utilized by policemen or clerks equipped with an inexpensive hand-held calculator.

As a practical matter, the NHTSA expects that many users of VINs will utilize a combination of the two routines to minimize VIN error. Thus, the format of a VIN will be checked against that expected for a particular manufacturer and the check digit will be utilized to ensure that VINs which are properly formatted also contain the proper alpha and numeric characters.

Given the fact that both approaches would reduce the error rate, the NHTSA concluded that it would utilize the check digit since its use did not limit the flexibility of the system. The fixed format proposed by VESC-AAMVA did provide information they sought. However, other users of the VIN, notably the manufacturers and the research community, were not provided the flexibility to make use of the potential capacity in the VIN to provide additional information.

Several of the commenters, particularly those from the insurance industry, raised the questions of whether the check digit would be utilized by all users and the inability to determine the correctness of the VIN if the check digit was not used. While the authority of the NHTSA extends only to motor vehicle manufacturers, the agency fully expects all users interested in maintaining the integrity of their records to utilize the VIN with the check digit.

Some commenters also stated their fear that when the VIN was reported from the field, some observers might neglect to include the check digit. Consequently, the check digit has been repositioned from the end of the VIN to the end of the second section to make it an integral part of the VIN.

Several commenters questioned the need for the check digit, pointing to the experience of the State of North Carolina in reducing its VIN transcription error rate to less than 1 per cent without the benefit of either a check digit or alpha/numeric designation requirements. The NHTSA would seriously consider any petitions for reconsideration which clearly demonstrate that neither a check digit nor alpha/numeric designation requirements is necessary to substantially reduce error in transcribing the VIN.

Reporting Requirements

Some commenters questioned the NHTSA proposal in that it allows manufacturers to display information in a unique format and to change that format within 60 days notice to NHTSA. They felt this would create confusion and the added expense of continual reprogramming.

However, it should be noted that the VESC-AAMVA system also allows manufacturers that same right, i.e., the right to change the code which represents various informational elements, but makes no provision for advance warning. Indeed, the VESC-AAMVA system is silent as to how the users of the VIN will be informed of the meaning of the characters adopted by manufacturers. Consequently, no change is made to the reporting requirements as proposed by the agency. It should be noted that the NHTSA does not anticipate that manufacturers will have any need to change codes within model years.

The principal authors of this notice are Nelson Erickson of the Office of Vehicle Safety Standards, Crash Avoidance Division, and Frederic Schwartz, Jr., of the Office of Chief Counsel.

In consideration of the foregoing, Standard No. 115, 49 CFR 571.115 is amended. . . .

(Sec. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 11, 1978.

Joan Claybrook
Administrator

43 F.R. 36448-36452
August 17, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 115

Vehicle Identification Number

(Docket No. 1–22; Notice 8)

Action: Final rule and response to petitions for reconsideration.

Summary: This notice amends Federal Motor Vehicle Safety Standard No. 115, *Vehicle identification number.* It establishes a fixed format for vehicle identification numbers (VINs) assigned to passenger cars, multipurpose passenger vehicles with a gross vehicle weight rating of 10,000 pounds or less and trucks with a gross vehicle weight rating of 10,000 pounds or less. This amendment is made to meet the needs of State motor vehicle administrators, insurance companies and other users who desire a means of discovering certain types of transcription errors in VINs at the earliest possible stage. To facilitate manufacturer compliance with this amendment, the requirement that gross vehicle weight rating (GVWR) be decipherable from the VIN of passenger cars is deleted.

The notice also positions the check digit, a means for detecting errors in the VIN, immediately following the eighth character of the VIN. This amendment is made to facilitate manufacturers encoding the VIN.

The date of September 1, 1980, for compliance with the standard is retained but specific authorization of an earlier optional compliance date is deleted.

The requirement that the three sections of the VIN be separated by spaces is also deleted in the interest of lessening the cost burden to manufacturers and promoting international harmonization. The requirement that VIN characters have a minimum height of 4 mm is limited to the VIN displayed in the vehicle passenger compartment, as only that VIN needs to be read from a distance.

In response to petitions, the responsibility of assigning the VIN to motor homes is shifted from the final stage manufacturer to the incomplete vehicle manufacturer.

The standard is also amended to simplify GVWR encodement requirements for vehicles. Petitions to delete the requirement that engine type and net brake horsepower be encoded in the VIN of certain vehicles are denied, but petitions are granted to delete engine make and model from the information required for vehicles with a GVWR of over 10,000 pounds.

Effective date: September 1, 1980.

For further information contact:

Frederic Schwartz, Jr., Office of the Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1834).

Supplementary information:

On November 9, 1978, the National Highway Traffic Safety Administration published in the Federal Register two notices relating to Federal Motor Vehicle Safety Standard No. 115, Vehicle identification number (49 CFR 571.115). These notices, which were issued in response to petitions for reconsideration, amended the standard (43 FR 52246) and proposed additional amendments to the standard (43 FR 52268). Several petitions for reconsideration of the amended standard were received, as were a number of comments concerning the proposal.

The establishment of an acceptable VIN standard has been a long and arduous process. As was pointed out in the advance notice of proposed rulemaking published in the Federal Register on September 9, 1976 (41 FR 38189), NHTSA activity in this area was preceded by the development of a number of competing, incompatible VIN schemes. The two major VIN schemes were that of the Vehicle Equipment Safety Commission (VESC) (supported by the American Association of Motor Vehicle Administrators and the States) and that of the International Standards Organization (ISO) (supported by the European Economic Community and most domestic and foreign vehicle manufacturers). These schemes were the ones on which the NHTSA focused as a starting point in its effort to establish a standard that would meet the need for motor vehicle safety and serve the needs of all VIN users. As the rulemaking progressed (43 FR 2189, 43 FR 36448, 43 FR 52246, 43 FR 52268), both the ISO and VESC schemes came closer together. However, both schemes remain incompatible in a number of respects.

The uses and users of the VIN have been discussed in detail in previous notices. In summary, the VIN is used as the key vehicle identifier by motor vehicle administrators, manufacturers, insurance companies, law enforcement agencies, and the NHTSA. It is the cornerstone of the safety defect and standard noncompliance recall program, and an important element in manufacturer quality control and in vehicle theft recovery. Its use as an information tool in the analysis of accident reports is of great importance to safety research and rulemaking.

The NHTSA standard adopts the most efficient and effective aspects of both the VESC and ISO standards, while broadening those standards' information function to include matters of specific importance to this agency's safety responsibility. Further, the NHTSA standard includes features which result in more data storage accuracy than is possible under the VESC standard, while remaining harmonious with the ISO scheme now adopted by the European Economic Community.

Engine Type Information

Several manufacturers petitioned to remove the requirement that engine net brake horsepower be decipherable from the second section of the VIN. The basis for this request was that the definition of "Engine Type" includes net brake horsepower among the characteristics to be considered in differentiating one engine type from another.

These petitions are denied. While net brake horsepower is among the characteristics to be considered in establishing an engine type, there is no requirement that it be encoded in the engine type code. In some instances, such as with heavy truck engines, encodement would not be practicable. However, if net brake horsepower is actually decipherable from the engine type, then the requirement that it be decipherable from the second section of the VIN is met and it need not be encoded a second time.

Several petitioners requested a clarification of the meaning of "make and model" in relation to engine type and a definition of "net brake horsepower." International Harvester (IH) also petitioned to eliminate engine make and model information encoding requirements for trucks since they utilize more makes and models than can be represented by one position in the VIN. Further, IH stated that in its view this information has no safety relationship.

To clarify the requirements for "make and model" information, the phrase "manufacturer and make" is substituted in the definition of engine type. The term "manufacturer" has its current meaning within Part 571, and the term "make" as defined in S3 is expanded to include engines. Thus, engine "make" is defined as the name which the manufacturer applies to a group of engines (e.g., General Motors Oldsmobile engine).

The specific reference to engine make and model was added to the definition of engine type at the request of the States. They were concerned primarily about the problem of engine switching between the divisions of passenger car manufacturers. The NHTSA is also concerned that this information be available to ensure the accuracy of its safety and fuel efficiency research, since the performance of two different engines classified as the same "type" may differ. The NHTSA concludes it can resolve these concerns while not placing an unnecessary burden on truck and other heavy duty vehicle manufacturers where engines are used interchangeably. Therefore, the requirement that engine make and model be reflected in the VIN is amended to require only that engine manufacturer and make be reflected for passenger cars, multipurpose passenger vehicles with a

GVWR of 10,000 pounds or less, and trucks with a GVWR of 10,000 pounds or less. It is in these categories of vehicles that engine types are standardized and consumers are less knowledgeable about the specifications of the vehicles they purchase.

Harley-Davidson Motor Co., Inc. also asked the agency to define the term "net brake horsepower" and to indicate whether SAE Standard J245 was the intended meaning. Because several definitions of net brake horsepower exist, the agency has concluded not to specify the precise definition to be used, thereby allowing manufacturers to continue using their current method of evaluating the net brake horsepower of their vehicles. In submitting the net brake horsepower of these vehicles, however, manufacturers should submit the definition of the term they are utilizing.

VIN Legibility

In the final rule published on August 17, 1978 (43 FR 36448), S4.5 provided that the three sections of the VIN should be grouped, i.e., appear as a full section without being split, but inadvertently omitted the provision that had been proposed for requiring spacing between the sections. This omission was corrected in the amendment to the rule published on November 9, 1978 (43 FR 52246), which specified that the space between sections shall be twice that of the space between characters.

A number of manufacturers petitioned for reconsideration of this provision, claiming lack of notice for it. These manufacturers indicated what they considered to be serious lead time problems and substantial cost increases if the spacing requirement was not deleted. They also cited section 5.7 of ISO 3779, which provides that spaces should not appear in the VIN, although a symbol or character may be used between sections. While the agency still believes that separating the three sections of the VIN would improve the accuracy of its transcription, the added cost burden to the manufacturers and the interests of international harmonization argue in favor of deleting the spacing requirement. The requirement is therefore eliminated. The agency points out, however, that the legibility of the VIN is of concern and will be carefully reviewed after the standard takes effect.

Ford Motor Co. points out that S4.3.1 requires that all characters in the VIN must have a minimum height of 4 mm regardless of where the VIN appears on a vehicle. The intent of the agency, as Ford correctly perceives, was to limit the requirement to the VIN as it appears in the passenger compartment, since only in that location need the characters be read from a distance. The standard is amended to make this limitation clear.

Incomplete Vehicle Attributes

Table I in the standard categorizes vehicles by type and specifies the vehicle attributes that must be decipherable from the VIN for each type. In the amended standard published on November 9, 1978, the agency added a type designated "incomplete vehicle." The attributes required to be decipherable from the VIN for this type were those attributes common to both trucks and buses. This type was established because incomplete vehicles often may be completed as either a truck or a bus, and the incomplete vehicle manufacturer would have little way of knowing the final configuration.

American Motors Co. petitioned the agency to delete the requirements for incomplete vehicles and require instead that the second section of the VIN of incomplete vehicles reflect those attributes which the incomplete vehicle manufacturer anticipates the vehicle will have when completed. As this would place a more onerous burden on the manufacturers by requiring additional information to be encoded than the current requirement, as well as call for considerably more prescience than the manufacturers have suggested they usually possess, the petition is denied.

In this regard, it should be noted that the language of S4.5.2 and the "incomplete vehicle" type category in Table I contained in the amendment to the rule published November 9, 1978, were inadvertently omitted from the notice of proposed rulemaking issued the same day. The amended rule issued today corrects that error. The definition of the term "type" is also amended to include "incomplete vehicle" as a separate type.

Assignment of the VIN to Motor Homes Manufactured in More Than One Stage

The amendment published on November 9, 1978, provided that in the case of vehicles other than motor homes, manufactured in more than one stage, the VIN would be assigned by the incomplete vehicle manufacturer. In the case of motor homes, the final stage manufacturer would make the assignment. The rationale of the agency for requiring the final stage manufacturer of motor homes to assign the VIN rested on two grounds. First, the comments to the docket submitted by the Recreational Vehicle Industry Association (RVIA) in response to the notice of proposed rulemaking (Docket entry 1-22-N04-048) appeared to support motor home manufacturers assigning the VIN for their vehicles, and the RVIA did not petition to change the requirement after the publication of the final rule on August 17, 1978. Secondly, a number of States and State organizations pointed out the law enforcement problems inherent in identifying a vehicle whose outward appearance was, for example, a Winnebago while the manufacturer identifier indicated the vehicle was a Ford.

In response to the November response to petitions, petitions for reconsideration were received from the RVIA, jointly from the VESC and the AAMVA (VESC/AAMVA) and from the State of Maryland. The RVIA, in its petition, appears to have reversed its previous position, and cites a number of practical and economic reasons why the incomplete vehicle manufacturer should assign the VIN to motor homes. These include the need for uniform VIN assignment by the incomplete vehicle manufacturer, unavailability to the final stage motor home manufacturer of necessary data concerning the incomplete vehicle, the need of incomplete vehicle manufacturers to carry out recall campaigns, and the economic burden on lower volume motor home manufacturers. The VESC/AAMVA and State of Maryland in their petitions appear to believe that law enforcement officers will be able to identify motor homes by the manufacturers of their underlying chassis. Further, it appears that the States adopted a procedure on September 14, 1978, by which the final stage motor home manufacturers would add an additional three character identifier to the incomplete vehicle manufacturer's VIN. The States would then add that identifier to their VIN files.

It is not clear to the agency how the States can include this additional information in their data storage systems based on their stated capacity in other comments to the dockets. Nonetheless, the exception to the rule in the case of motor homes was created in response to the initial comments of the manufacturers and the States. They now conclude such a provision will be a hindrance. For that reason and because either the incomplete vehicle manufacturer or the final stage manufacturer is capable of providing a VIN, the agency believes it appropriate to remove the exception. Therefore, sections S2, S3, and S4 are amended accordingly.

Mack Truck also petitioned to eliminate requirements for encoding those truck attributes which can be easily altered by purchasers. While it is true that several of the attributes required might occasionally be subsequently altered, such as altering gross vehicle weight rating by changing tires, the agency concludes that this information is still important as a basic classifier of vehicle type for safety research and should be required. In most instances, the agency believes this information will not become invalid.

Check Digit Highlighting

The November 1978 notice of proposed rulemaking requested comments on the effectiveness and advisability of highlighting the check digit as an aid in locating it on the VIN plate. All commenters, whether manufacturer or VIN user, recommended that the check digit not be highlighted. The comments suggested that highlighting the check digit would increase cost to manufacturers and confusion among users without comparable advantages in check digit recognition. Consequently, the NHTSA has concluded that the check digit is sufficiently recognizable by its physical position in the VIN without being further highlighted.

Weight Increments For Vehicles With a Gross Vehicle Weight Rating Greater Than 10,000 Pounds

In the Notice of Proposed Rulemaking issued November 9, 1978, the Administration proposed that the weight rating data for vehicles with a gross vehicle weight rating greater than 10,000 pounds be delineated in 5,000 pound increments.

The Freightliner Corporation supported the amendment, stating that gross vehicle weight rating was an important statistical consideration. The Motor Vehicle Manufacturers Association and General Motors recommended that the GVWR not be required for vehicles with a GVWR over 10,000 pounds, as this information is contained on the certification label. The MVMA also questioned why this information is required for trucks with a GVWR of less than 10,000 pounds, but not for passenger cars. Ford Motor Co. commented similarly.

International Harvester (IH) also opposed the amendment because it would restrict IH's current VIN scheme and because the GVWR of incomplete vehicles is easily modified. Freightliner reached the opposite conclusion in its comment, stating that it is not economically feasible for drastic changes to be made in GVWR after initial manufacture. Paccar, Inc. did not oppose the proposal, but recommended instead that the classification system currently being used in the industry, which consists of eight weight rating classifications, be substituted. In this way, Paccar argues, GVWR information would be more relevant to manufacturers and easier for the manufacturer to encode.

As the agency pointed out in previous notices, highway safety research can be carried out utilizing the VIN appearing on accident reports even though the vehicle itself is not available. Consequently, the appearance of the GVWR on a vehicle's certification label is not a substitute for encoding the GVWR in the VIN. While GVWR does not indicate the actual load being carried by the vehicle, it is extremely useful in classifying the vehicle itself, particularly its size. After reviewing the comments received on this proposal, the agency has concluded GVWR information for trucks should be retained, since it facilitates analyzing differences in performance and accident experience of different size vehicles.

The agency is also persuaded by the argument of Paccar that institutionalizing the weight rating classification system currently being used in the industry would be equally useful and considerably less disruptive. For example, certain vehicle models fall within one weight rating class although they may fall within two GVWR categories utilizing the proposed system. The standard is, therefore, amended accordingly.

The requirement that GVWR be supplied for passenger cars was deleted because there were not enough codes to include that information in a fixed format system along with the other passenger car information considered more important by the agency. Information relating to the GVWR for light trucks was considered more important, as it represents not only a way of identifying and monitoring the vans and light trucks which are becoming an important element of the vehicle population as distinguished from heavy trucks, but also the weight makeup of that class. The NHTSA denies, therefore, petitions to eliminate the requirement for encoding the GVWR of trucks and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. However, to take account of the fact that there are fewer models of light trucks and to ease the burden on manufacturers, the number of GVWR weight categories is reduced to eight for vehicles with a GVWR of 10,000 pounds or less.

Also with respect to light trucks, the agency wishes to note that while it has not included a requirement that restraint type information be supplied for light trucks, it does intend to propose this requirement when it proposes passive restraint systems for those vehicles.

VIN Fixed Format

In the notice of proposed rulemaking published on November 9, 1978, the agency proposed further fixing the VIN format by specifying the alphabetic or numeric nature of the 4th, 5th, 6th, 7th, 11th, and 12th characters of the VIN for passenger cars, multipurpose passenger vehicles with a GVWR of 10,000 pounds or less, and trucks with a GVWR of 10,000 pounds or less. In making the proposal, the agency explored in detail the advantages and disadvantages of fixing the format. In summary, fixing the format will allow some types of VIN errors to be corrected when initially transcribed by clerks and others who can quickly become familiar with the established format. In addition, forms on which the VIN is transcribed can be designed to indicate whether a character should be alphabetic or numeric. However, fixing the VIN format will not eliminate the need for the check digit, will lead to a reduction in the information-carrying capacity of the VIN, and will result in alterations to the VIN schemes which manufacturers now utilize.

Comments in response to the notice confirmed the NHTSA analysis of the matter. Specifically States supported the conclusions about the effect of expanding the fixed format on transcription error rate and the manufacturers supported the conclusions about the effect of the expansion on the information capacity of the VIN. Manufacturers commenting on the proposal were unanimous in their opposition. Chrysler predicted more costly and complex decoding. Toyo Kogyo concluded that a fixed format would end any hopes of continuing their system of specific information being encoded in specific positions. Volkswagen pointed to a major disruption in their current system, and questioned why further fixing the format was necessary as German clerks have achieved an error rate of approximately 1 percent without the format fixing.

Similar objections to those cited above were made by other manufacturers commenting.

In addition, Rolls-Royce Motors requested that if a format is to be fixed, all characters should be specified as alphabetic. In this way, Rolls-Royce, as a low volume manufacturer, could reflect changes in a vehicle without also having to change the actual model code. British Leyland Motors, Inc. also requested that the first four characters of the second section be alphabetic to provide for additional informational capacity. Toyota proposed that the fourth as well as the fifth characters of the second section not be fixed for the same reason.

The Motor Vehicle Manufacturers Association, Ford Motor Co., and International Harvester specifically objected to specifying for cars, light trucks, and light multipurpose vehicles that the 3rd character of the 3rd section (i.e., the 11th character of the VIN) of the VIN must be numeric. Their objections were based on the resulting substantial reduction in the number of unique manufacturer identifiers for manufacturers producing less than 500 vehicles per year which would be available in the third section. Also, several truck manufacturers pointed out that they utilized the 11th character of the VIN to represent the assembly line on which the truck was produced, and that they maintained more assembly lines than the number of numerical characters available.

The VESC/AAMVA, the States, and the insurance industry all supported the fixed format scheme, pointing to an anticipated lessening in the number of transcription errors as described by the agency in the NPRM.

The petitions requesting a flexible format or changes in the character specifications are denied except for those requesting that the 3rd character of the 3rd section be permitted to be either alphabetic or numeric. The agency recognizes that the use of a fixed format will result in a substantial reduction in the information carrying capacity of the VIN. However, the avoidance of transcription error remains the paramount concern. Nothing in the docket suggests that the administration was incorrect in its assumption that transcription errors will be reduced by the use of the fixed format system.

Fixing the format of the 3rd character of the 3rd section presents a more difficult choice. On one hand, fixing the format of this character as numeric will identify an error if an alphabetic character is substituted. However, since the preceding character is not specified as either numeric or alphabetic and the character following it is numeric, the opportunity to identify transpositions of these characters is limited. On the other hand, it seems possible that the number of manufacturers producing less than 500 passenger cars, multipurpose passenger vehicles or trucks with a GVWR of 10,000 pounds or less a year over the next 30 years will exceed the capacity of the VIN with the third character of the third section fixed. This is particularly true as the recreational use of these vehicles increases.

Further, the ability to locate the assembly line on which a defective vehicle is manufactured will have an important safety benefit. In cases involving manufacturing defects, this information will enable a determination of which of similar vehicles produced on different assembly lines need to be recalled. Consequently, the agency has determined not to adopt the proposed requirement that the 3rd character of the 3rd section of the VIN be numeric. In this way, a sufficient number of manufacturer identifiers can be assured with the least disruption to the existing system used to identify trucks.

The VESC/AAMVA and several other commenters suggested that the NHTSA VIN system could be further improved by fixing the specific information required to be decoded from each position of the second section of the VIN. These petitions are denied. Fixing the information contained in each position of the second section of the VIN would have no effect on the accuracy of transcription of the VIN, since clerks and others could not easily memorize the myriad of characters manufacturers use to represent data contained in these positions. While the information contained in the second section would be more easily decipherable by those using a table if each position were specified, the amount of information which could be represented would be substantially decreased and the disruption to manufacturers substantially increased.

These problems were resolved by the VESC, after discussions with the manufacturers, by specifying the content of only one character of the second section in establishing the VESC VIN. With the NHTSA requirement for encodement of additional information beyond that required by the VESC, the agency concludes that specifying the informational content of each character in the second section is not practicable.

Although discussed comprehensively in previous notices, it should be noted again that the adoption of a fixed format only eliminates a particular class of VIN errors and in no way eliminates the need for the check digit. While the fixed format is able to identify those errors which result in an alphabetic character being substituted for a numeric character or vice versa, the check digit process will detect most erroneous characters regardless of type. Because vehicle owners are notified of recalls through their vehicle's VIN, it is essential that this information be retained in the most accurate fashion possible.

Check Digit Position

In the notice of proposed rulemaking issued on November 9, 1978, the agency proposed positioning the check digit immediately preceding the fourth position of the VIN in the interest of international harmonization and manufacturer ease of compliance. As the agency pointed out in the notice, the second section of the VIN system adopted by the ISO contains 6 characters. By having the check digit immediately precede or follow the second section, the five characters of the second section plus the check digit become the 6 characters necessary to assure compatibility with the ISO standard. If the check digit is positioned at either end of the VIN, the second section contains only 5 characters and the VIN is incompatible with the ISO system. However, specific comments were also requested concerning the advantages of placing the check digit at either end of the VIN.

Several States and the VESC/AAMVA submitted comments which supported placing the check digit at the beginning of the VIN.

In its comments, Maryland did not object to the check digit. It felt that the combination of fixed length, improved format, and the check digit routine will reduce transcription errors and provide an edit routine to ensure file integrity. However, Maryland also anticipated that some States would not be able to store a 16 character VIN. (For the purposes of comparison, it bears emphasis that the NHTSA VIN has 16 characters plus a check digit, the VESC VIN has 16 characters, and the ISO VIN has 17 characters.) These states would, in Maryland's view, eliminate prior to computer storage the check digit and perhaps a second character after producing a certificate of title. If the certificate of title were subsequently lost, there would be no record in the State files of a complete VIN, and the owner would have a great deal of trouble when transferring title to the vehicle.

In a similar situation, Maryland believes some States will choose to eliminate the check digit and a character of the VIN prior to producing the certificate of title, thereby creating a defective title which another State could refuse to honor. Indeed, Maryland considers this problem so serious that it believes a uniform system of dropping characters from the VIN is a certainty if additional Federal funds are not available to pay for additional State VIN storage capacity.

From this state of affairs, Maryland concludes that placing the check digit to the left or right of the VIN would encourage the check digit to be dropped in the inevitable uniform system of dropping VIN characters.

The NHTSA does not concur in this analysis. Since the States have supported in their comments to the docket the 16 character VESC VIN, the agency assumes they are willing to store this number of characters and that they would have developed the capacity necessary for that purpose even in the absence of the NHTSA VIN. If a State desires to drop the check digit, rather than store it, the State can do so irrespective of its position in the VIN either by appropriate data processing techniques or by simple and proper design of the forms on which the VIN is transcribed.

As Maryland points out in its comment, and as the agency has pointed out in previous notices, the NHTSA does not regulate the States in regard to the VIN. Thus, the NHTSA cannot require the State to store or use the check digit. The agency is confident, however, that States will seek to facilitate their citizens being made aware of potential safety defects and noncompliances in their vehicles and to simply their task in transferring their vehicles. Consequently, the agency believes they will utilize the simple data processing procedure for eliminating the check digit if they chose not to store it. The State comments to the docket would indicate, however, that all six are planning to store the 16 character VIN and the check digit.

The Vehicle Equipment Safety Commission and the American Association of Motor Vehicle Administrators (VESC/AAMVA) also responded jointly on December 11, 1978 to the notice of proposed rulemaking. In addition, certain aspects of their submission were supplemented by the VESC on December 29, 1978, as the result of NHTSA questions about the basis for their submission, and this supplement has also been placed in the docket (01–22–NPRM–No. 7–41).

The VESC/AAMVA comment of December 11, 1978, maintained that from 35–37 States are currently incapable of "inputting" 17 characters into their vehicle identification files. In its supplementary docket submissions, the VESC stated that it was unable at that time to submit a list identify those States which could not input 17 characters. The VESC also explained that while in most instances State capability could be expanded by reprogramming and the purchase of additional equipment, this would be very expensive.

Like Maryland, the VESC/AAMVA concluded that those States which are unable to currently input 17 characters for lack of equipment and appropriate programming will choose to drop at a minimum the check digit. This will create, in the view of the VESC/AAMVA, lack of uniformity, confusion, and a regenerated check digit based on the State's computation which will differ from the manufacturer-assigned cheeck digit. To place the check digit anywhere but the beginning or the end of the VIN, in the view of the VESC/AAMVA, would create "unacceptable data handling and data regeneration problems." Therefore, the VESC/AAMVA concluded that the check digit must be dropped entirely or moved to the left of the VIN.

In its supplement, the VESC/AAMVA explained that the data handling problems referred to were "incorrect inputs" into the computer because State personnel would drop by mistake a character which was not the check digit while transmitting the VIN. Further, problems would occur due to the inconsistency between States which have a 16 character VIN capacity and States which have a 17 character VIN capacity.

The VESC/AAMVA also maintained that the cost burden to the States to comply with the NHTSA standard would be substantial. Vermont, the only State whose cost VESC cited with confidence, projected a cost of $250,000 to implement the NHTSA VIN system and a 2 to 3 year completion date. The VESC/AAMVA reported that Vermont has only 380,000 vehicles and limited on-line computer time. Consequently, the cost for a State with more sophisticated computer equipment would be considerably higher in the VESC/AAMVA view. Vermont also advised the VESC/AAMVA that only a negligible amount of Federal funds would be available to carry out the changeover.

The VESC/AAMVA stated that specific cost data from the other States was not available, but the cost to the States of Illinois, Michigan, and New York would be materially higher than Vermont, and that Massachusetts was projecting a

VIN changeover cost of from $300,000 to $400,000. In the case of Massachusetts, it is not clear whether this represents the changeover cost to convert to the VESC VIN or NHTSA VIN.

In its supplement, the VESC/AAMVA was unable to provide at that time further data on these cost figures for the NHTSA VIN.

The VESC/AAMVA also attacked the rationale of the agency in placing the check digit within the VIN structure. In the view of the VESC/AAMVA, the practical effect of that placement is mandating the recording and storage of a 17 character VIN. The VESC/AAMVA concludes that the NHTSA must either drop the check digit or place it outside the VIN structure.

Of particular concern to the VESC/AAMVA is the difficulty they suggest will be encountered in instructing a title clerk or police officer to drop the check digit in an internal position rather than in the first or last position. In its supplement, the VESC/AAMVA agreed with the agency that a computer can be programmed to drop any character in the VIN or the check digit and forms can be designed to indicate the check digit just as easily as they can be designed to show whether a character should be alphabetic or numeric. However, the VESC/AAMVA still believes strongly that a serious problem would exist if State personnel drop the check digit prior to transcription on a form or entry into a computer. Further, the VESC/AAMVA believes it impossible to design a form which signified the check digit for every intended use of the VIN.

The key question raised by the VESC/AAMVA relates to the ability of the States to deal with a 16 character VIN with an internal check digit. This issue was also of concern to the NHTSA. A review of the comments to the docket from the six States directly responding suggests that the problem is not as severe as the VESC/AAMVA believes, however.

Unfortunately, only three of these States submitted cost data to the docket, and the VESC/AAMVA was unable to submit data relating to their conclusions. Further, as noted above, the agency has not received information from the VESC/AAMVA concerning the additional cost of implementing the NHTSA VIN system as compared to the cost of implementing the 16 character VIN system proposed by the VESC.

Oregon estimated its cost to implement the NHTSA VIN system at $17,650 for reprogramming. Vermont estimated its costs at $250,000, of which $180,000 would be for systems analysis and programming and $70,000 would be for public relations, training, and redesigning forms. Washington State estimated its costs for implementing the NHTSA VIN system at $36,000 the first year for reprogramming, equipment, and key punching, and $25,000 each subsequent year for equipment and key punching.

The agency does not understand why the changeover costs of Vermont are approximately 10 times higher than the two other States submitting cost data. The agency notes, too, that the motor vehicle population of Vermont is approximately one-eighth that of Washington and one-fifth that of Oregon. The cost of adopting either the NHTSA VIN system or VESC VIN system should be approximately equivalent and should consist primarily in reprogramming and procuring additional computer data storage units, and these costs should be in some degree proportional to the vehicle population. The agency does note, however, that Vermont's highway safety annual work program for this fiscal year includes spending $280,000 to implement a R. L. Polk computer program to check for valid VIN's. Since this R. L. Polk program will be outdated with the promulgation of the NHTSA standard, the agency hopes that Vermont's implementation of the NHTSA VIN system can be consolidated with the implementation of a revised VIN edit routine, thus achieving some savings for Vermont.

Based on the agency's assessment of implementation costs and on the actual cost data submitted to the docket, the NHTSA concludes that the cost to be incurred by the States to implement the NHTSA VIN system will not be so significant as the VESC/AAMVA comments suggested. As explained previously, the primary costs to the States of implementing the NHTSA system would be those of reprogramming and of purchasing additional data storage equipment.

The agency's conclusion about lack of substantial cost is further supported when one considers that the members of the VESC adopted and the

States supported the VESC 16 character VIN system. Presumably, the States were prepared to adopt it. Thus, the cost burden which the NHTSA regarded as particularly important to the States is the incremental cost of the NHTSA VIN system over the VESC VIN scheme. In the case of Oregon, the cost differential between the NHTSA and VESC VIN systems would be negligible, as only reprogramming is required and the effort needed to reprogram for 17 characters, either stored or dropped prior to storage and then regenerated, would not be substantially more than it would be for 16 characters. In the case of Washington, the State itself estimates the added cost of the NHTSA system over the VESC system would be $2,500 annually for keypunching the added character.

The agency remains convinced that the States will seek methods of simplifying and standardizing titling and other procedures involving the VIN. All parties appear to agree that by proper design of forms and relatively simple programming of computers, the check digit may be eliminated from any location within the VIN should a State choose to do so. It appears all agree, also, that the appropriate check digit may be regenerated when the VIN is removed from data storage and printed. What the VESC/AAMVA and Maryland appear to fear, however, is that police officers, clerks, and others will attempt to locate and eliminate the check digit in the process of transcribing the VIN. Why persons would be instructed to drop the check digit has not been suggested, however. Further, simple instructions should prevent that from occurring. Accordingly, premature dropping of the check digit is clearly avoidable. The agency is impressed that none of the States directly submitting comments to the docket have suggested that it does not intend to store the check digit along with the VIN.

The VESC/AAMVA has incorrectly evaluated the practical effect of placing the check digit within the VIN. The placement of the check digit within the VIN does not necessitate the storage of the check digit. Further, as the agency expressly explained in the previous notice and above, the choice was made to allow the VIN mandated by the NHTSA to be compatible with the VIN mandated by the ISO. In this way, manufacturers could use the same VIN structure on vehicles marketed in the United States and those marketed outside the country. The international harmonization of the NHTSA VIN Standard is not only consistent with United States policy in this area as articulated by the President (14 Weekly Comp. of Pres. Doc. 1630), but eases substantially the regulatory burden on manufacturers producing vehicles for both the United States and foreign markets since they need not maintain two separate VIN systems. If the VESC VIN scheme was adopted, manufacturers would face the added cost of maintaining one VIN system for the United States and another VIN system for the rest of the world.

Comments were also received on the question of the check digit position from a number of insurance companies and insurance industry groups. Nationwide Insurance stated that the location of the check digit within the VIN should not present any problem to VIN users since sophisticated procedures were not necessary to manage the check digit regardless of its position. Further, the use of the check digit caused Nationwide no great concern. The Alliance of American Insurers believed some users would prefer the check digit be placed outside the VIN, but stated that "ideally" the check digit should be retained as an integral part of the VIN. State Farm Insurance Co. stated that it intended to store the check digit, but suggested it should be positioned at the beginning or end of the VIN in the interest of allowing it to be dropped more easily by users who did not intend to store it. State Farm did not explain how the ease of dropping the check digit varied with its position. Allstate Insurance Co. supported the use of the check digit, and recommended that it be made an internal part of the VIN. Finally, the Insurance Institute for Highway Safety strongly supported making the check digit an internal part of the VIN.

No manufacturer supported moving the check digit to the first or last position of the VIN, but there was a difference of opinion among the manufacturers whether the check digit should precede or follow the second section of the VIN.

Volkswagen and British Leyland supported placing the check digit immediately preceding the second section of the VIN, as this would make the VIN more compatible with the European VIN system. General Motors and American Motors supported the check digit in this same position, as this seemed to foster international harmonization. International Harvester supported the check digit in this position, as this would be least disruptive to its current system. While not commenting to this docket on the issue, Mercedes-Benz and BMW supported in their petitions for reconsideration of the August 18, 1978 rule placing the check digit immediately preceding the second section. Mercedes supported this position because it would cause the least disruption to its current system. BMW supported this position because the check digit would then not separate the two flexible sections of the VIN, thus allowing the establishment of a VIN "management system".

Harley-Davidson, Toyo-Kogyo, Chrysler, and Peugeot-Renault supported the check digit immediately following the second section, as this separated the fixed section of the VIN from the variable section of the VIN. Rolls-Royce supported the check digit in this position, as it has already begun work on a system which would position it there.

Ford and the Motor Vehicle Manufacturers Association took no position on whether the check digit should precede or follow the second section so long as it was in one of those two positions.

In its notice of proposed rulemaking published on November 9, 1978, the agency relocated the check digit to a position preceding the second section of the VIN in the interest of ease of compliance for those manufacturers who desired to use a different system in Europe than they did in the U.S. It seems, however, that the manufacturers are unable to agree upon which position actually is preferable. The agency must therefore determine which position makes more practical sense.

The agency concludes that the check digit should be placed in immediate proximity to characters which are variable. While only some manufacturers may have to change manufacturer identifiers if they produce more than one type of vehicle, all must change the final eight characters of the VIN. Consequently, the agency concludes that the check digit should precede these final eight characters since it too is variable. Thus, many manufacturers will be able to prepare their VIN plates with the first part of the VIN prestamped. This will lower costs and aid in preventing alterations since these characters can be molded as part of the plate.

Some manufacturers and manufacturer associations also petitioned to eliminate the check digit entirely. The agency's rationale for the check digit and its utility in eliminating error have been comprehensively reviewed in previous notices. In summary, the check digit offers the most effective way known to the agency to determine erroneously recorded VINs prior to storage in motor vehicle files.

Peugeot-Renault raised in their comment a new issue of international harmonization. In the view of Peugeot-Renault, the ISO standard requires that the middle section of the VIN remain the same for all vehicles of the same description. After a review of the ISO standard, the NHTSA cannot agree with this view. ISO Standard 3779 specifically provides that if not all the characters in the second section of the VIN are used for descriptive purposes, the manufacturer may fill the section with another character for which there are no restrictions.

Optional Early Compliance

The NPRM proposed that compliance with all aspects of the amended standard be permitted beginning September 1, 1979, for passenger cars and be required for all vehicles beginning September 1, 1980. Optional early compliance was proposed because the agency concluded that some manufacturers could fully implement the amended standard before September 1, 1980, and because the agency was concerned that implementation of the amended standard might be complicated by the State of Maryland's proposal to implement an inconsistent VIN system on January 1, 1980. Express authorization of early compliance would have put the amended standard into effect on September 1, 1979, and removed any question about the preemption of State standards governing VIN format and content.

The agency has since learned that the State of Maryland has formally proposed to change its implementation date to September 1, 1980. If that new proposal is adopted, the need for express authorization for early compliance with the amended NHTSA standard will be eliminated. Based on indications that the proposal will be adopted, the agency has decided to delete the express provision for early compliance. It should be clearly understood, however, that this deletion does not preclude early compliance with most aspects of the amended standard. Except to the extent that it is not possible for a manufacturer to comply simultaneously with an existing and future version of a Federal Motor Vehicle Safety Standard, early compliance is always permissible.

Effective Date

A number of commenters requested that the effective date be postponed to allow for acquiring equipment and for system development. Mack Truck requested that the effective date be postponed until two years from the issuance of the final rule. Volkswagen requested that the effective date be 18 months from the publication of the final rule. International Harvester opposed the September 1, 1980 effective date as not practicable, but did not suggest an alternative effective date. BMW recommended an effective date 3 years after the standard is issued. The VESC/AAMVA suggested an effective date two to three years after the standard is finalized. The State of Vermont proposes an effective date of September 1, 1981, or September 1, 1982, because its computer programming effort is committed for the next 1½ years.

The agency is unconvinced that the effective date of the standard should be changed. While the final details of the proposal were not known until today, the necessity of implementing a new VIN system and most of its essential features have been known at least since the August 1978 final rule.

With an effective date eighteen months in the future, the desires of Volkswagen have been met and the stated needs of Mack substantially met. While BMW and International Harvester believe they need more time to comply, they have presented no evidence in their comments that their systems development, reprogramming, and marking equipment installation cannot be accomplished within the specified time frame. Further, BMW must comply prior to September 1, 1980 with the compatible ISO standard, and presumably can comply with the NHTSA standard shortly thereafter. IH has stated that its inability to comply comes from the need to derive a new coding system. The agency believes 18 months will be sufficient for this purpose, as it is for the other manufacturers.

From the comments, it appears that California, Oregon, and Washington can comply with a January 1, 1980 effective date, and Maryland can prior to that date comply with a 16 character VIN requirement.

Of the States commenting, only Vermont believes it can not comply by September 1, 1980. Since Vermont's time problem rests with a prior 1½ year programming commitment rather than the 6–18 months the State considers necessary to implement the NHTSA VIN system, it is hoped that Vermont's revision of the now outdated R. L. Polk VIN verification program planned for this fiscal year can be combined with the reprogramming necessary to implement the NHTSA VIN system.

The VESC/AAMVA objected to the effective date on behalf of the States. The agency notes, however, that a 16 character VIN was adopted by the VESC in July 1977. Thus, the States were aware on that date that a 16 character VIN would be implemented shortly. Further, Maryland, by requiring passenger cars sold in that State after January 1, 1980, to have a 16 character VIN made it highly likely that manufacturers would adopt a 16 character VIN system by that date. (It should be noted that Maryland on February 9, 1979, proposed that its standard should take effect on September 1, 1980. This is the proposed effective date for the NHTSA standard). Manufacturers in all probability would not utilize one system for Maryland and another for the other States. The intent of Maryland to require manufacturers to comply with its VIN standard on September 1, 1980, whether or not the NHTSA extended the effective date of its standard, was confirmed on February 22, 1979 (Docket 01–22–No. 7–042). Consequently, any action of NHTSA to extend its effective date would not aid the States in view of Maryland's position.

The NHTSA concludes, therefore, that all States should have been prepared to deal with a 16 character VIN six months prior to the effective date of the NHTSA standard. This view is further supported by the comments of the States throughout this rulemaking effort which strongly supported the adoption of the VESC 16 character VIN scheme. Since the elimination of the check digit prior to storage is a reasonably simple task, the agency concludes the States will be able to deal with NHTSA-mandated VINs by the time the standard takes effect. The agency is also certain that the coordinative efforts of the AAMVA will aid the States in dealing with the NHTSA VIN system by the time the manufacturers comply with the standard. The agency too stands ready to provide technical assistance if any should be needed.

Therefore, petitions to change the effective date of the standard are denied.

Notice of Change in Encoded Data

The VESC/AAMVA and several States once again raised the issue of S6 of the standard which requires manufacturers to notify the NHTSA 60 days before changing the information decipherable from a particular VIN. It is the view of the VESC/AAMVA that requiring the manufacturers to submit this information to NHTSA will indirectly result in their not submitting it to the States.

This issue was discussed in the amendments to the rule published on November 9, 1978. The NHTSA is unable to understand why the manufacturers who voluntarily have been submitting material to the States since 1901 would suddenly cease doing so. The subsequent VESC submission to the docket does not explain the basis for its concern. In the unlikely event that the manufacturers cease to supply this data to the States, the NHTSA will entertain a petition for rulemaking from the States to institutionalize a requirement for the submission of that data to the States. Section S6.3 is amended, however, to require that all the information required to be submitted to the NHTSA shall be submitted at least 60 days before affixing the VIN utilizing the encoded information. This amendment is made to remedy an ambiguity in the standard as presently written.

Use of a Hand Held Calculator

In the final rule issued August 17, 1978, (43 FR 36448) the agency stated its belief that check digits could be calculated by using inexpensive, hand held calculators. The agency was not referring to the type of calculator currently available over the counter, but a calculator preprogrammed to carry out the check digit procedure when the VIN itself was keyed in. With the adoption of the fixed format as an aid in avoiding transcription errors, however, check digit calculations in the field are unlikely. Therefore, the availability of a preprogrammed calculator is no longer of concern to the agency.

The VESC/AAMVA also points out that the check digit system is not infallible since the same numerical value is assigned to three or four characters. For example, "D", "M", "U", and "4" are all assigned the numerical value "4" in the check digit procedure. The odds that one of these characters will be erroneously substituted for the other resulting in the correct check digit is only one in eleven, however. Consequently, the check digit procedure will reduce the number of incorrect VINs in computer files by more than 90 percent.

Manufacturer Identifier for Manufacturers Producing Less Than 500 Vehicles of Any One Type Annually

S4.5.1 of the standard provides a special procedure for assigning the manufacturer identifier to manufacturers who produce less than 500 motor vehicles of a type annually. In this procedure, the third character of the VIN is the number 9 and the eleventh, twelfth, and thirteenth characters of the VIN along with the first three characters represent the manufacturer identifier. The VESC/AAMVA objects to this provision as complicated to process by computer and suggests it should be eliminated.

This provision was adopted because the agency was unable to ascertain with certainty that there is a sufficient number of three character identifiers to uniquely represent all vehicle manufacturers, makes, and types over the next thirty years, the cycle of the amended standard. In addition, this method of identification is identical with the method adopted by the ISO, and its inclusion in the NHTSA standard would be a further step in the direction of international harmonization.

The agency is unconvinced that the problems expressed by the VESC/AAMVA are substantial. The occurrence of a VIN from a manufacturer of less than 500 vehicles of a type in any State's vehicle population will be rare. As the VIN format for a manufacturer of less than 500 vehicles of a type is the same as that for all other manufacturers, there should be no impediment to entering it into storage. The need to generate the name of the manufacturer from the data base, the situation where specific programming will be called for, will be even rarer. Against the arguments of the VESC/AAMVA, the integrity of the VIN system over thirty years and the interests of reducing compliance costs through international harmonization must prevail.

Reconstructed Vehicle VIN

The VESC/AAMVA and the State of Vermont again raise the issue of assigning a VIN to reconstructed vehicles. As was pointed out in the amendment to the rule published on November 9, 1978, amended Standard No. 115 only applies to reconstructed vehicles if the chassis is new. Evidently, the VESC/AAMVA and Vermont interpreted this to mean that the VIN of the original chassis should be assigned to the reconstructed vehicle. This is only true if the chassis is new, in which case the vehicle would be one manufactured in more than one stage and the incomplete vehicle manufacturer would assign the VIN.

The VIN for the homemade vehicles which Vermont apparently refers to would be assigned by Vermont, as it sees fit. Presumably, a reconstructed vehicle VIN scheme which was compatible with the NHTSA VIN system could be created, but such a scheme would not be within the ambit of Standard No. 115.

Assignment of Manufacturer Identifiers

Saab-Scania has requested further information concerning the assignment of manufacturer identifiers. When the final rule was issued, the Society of Automotive Engineers (SAE) immediately submitted on behalf of many domestic and foreign manufacturers a list of approximately five hundred identifiers. They have been registered to the manufacturers to whom they were assigned. Because the SAE has progressed so far in its assignment process, the agency is discussing with the SAE its assigning manufacturer identifiers on behalf of and under the authority of the NHTSA. A notice will appear in the Federal Register when this matter is resolved.

Public Meeting

The VESC/AAMVA stated that the agency had not followed through on its announcement in the advance notice of proposed rulemaking that it anticipated a public meeting for oral submission of comments concerning VINs. At the outset, the agency did contemplate the possibility of a public meeting to supplement the opportunity for written comment. Holding a meeting proved unnecessary, however. Substantial written public comments have been received in response to the agency's five notices. Comments received from the AAMVA and VESC are a good example of the comments received and their completeness in responding to the involved issues. For example, in response to the advance notice of proposed rulemaking, the AAMVA submitted not only staff comments, but also supplementary material from 50 States and the District of Columbia. Similarly, extensive comments were also submitted in response to the notice of proposed rulemaking.

The agency also notes that a public meeting concerning the VIN was held under the aegis of NHTSA's National Highway Safety Advisory Committee on March 21, 1978, in which the VESC and AAMVA participated. This meeting resulted in 61 pages of testimony and 110 pages of supplementary material. Further, meetings were held between the NHTSA and VESC and AAMVA personnel on September 21, 1977 (Docket 01-22-No. 3-92), November 4, 1977 (Docket 01-22-No. 3-93), and November 18, 1977 (Docket 01-22-No. 3-94).

Plant of Manufacture

BMW petitioned the agency to delete the requirement for encoding plant of manufacture, since it currently utilizes a seven digit production sequence number, the first character of which would occupy the space required to be occupied by the character designating the plant of manufacture. A system which would have allowed BMW to maintain a seven character sequential number was proposed in the notice of proposed rulemaking published on January 16, 1978 (43 FR 2189), but withdrawn in the face of criticism that it was too complex. BMW suggests no reason which would cause the agency to reopen the issue, and its petition is denied. The agency notes, however, that the rule does not restrict a manufacturer from submitting more than one character to represent a single plant. Consequently, a sophisticated allotment of sequential blocks might be sufficient to allow BMW to maintain its seven digit production sequence numbering system.

Meaning of Definition of "Chassis"

In the amendment issued on November 9, 1978 the agency clarified the meaning of the term "chassis" to at least discriminate between a truck and a truck-tractor. Ford has requested that this clarification be rescinded, as the 2 percent of its heavy truck chassis which are not sold as incomplete vehicles are completed at a later date under contract to Ford. When Ford assigns the VIN, it states it does not know the final form of the vehicle. To the extent Ford does not know the final form of the vehicle when it assigns the VIN, the chassis information need not discriminate between truck and truck-tractor.

Trailer VIN's

The Truck Trailer Manufacturers Association (TTMA) petitioned to delete the requirement that descriptive information concerning trailers be encoded in the second section of the VIN. The TTMA believes that this information will be of little use in defect and noncompliance recall campaigns. Further, the TTMA asked for specific examples of how this information would be useful in accident investigation. By deleting this requirement, the TTMA argues, the second section of a trailer VIN could consist of "0" or some other "neutral" character, thus reducing paperwork requirements and easing compliance for the smaller manufacturers.

The TTMA petition is denied. Trailers can be as different as a five foot, single axle, 500 pound GVWR platform trailer and a forty foot, multi-axle, refrigerated van of 40,000 pounds GVWR. The need to discriminate between these vehicles in accident investigation and research is apparent.

However, it should also be noted that the standard does not require that each character of the second section of the VIN reflect information, only that the second section as a whole reflect the required information. For example, if a small manufacturer produces 33 or less models which can be differentiated on the basis of the descriptive characteristics set forth in the standard, only one position in the second section of the VIN is needed to carry this information and the other four positions can be "0".

VIN Litigation

On January 8, 1979, the VESC and the State of Maryland filed with the U.S. Court of Appeals for the Fourth Circuit a petition for review of Standard No. 115. As required under Section 105 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1394), the agency has filed with the Court the record of the rulemaking proceeding prior to this amendment. To facilitate public review of the material which the agency included in the record, publicly available documents not previously submitted to the docket but cited in the rulemaking notices have been placed in a general reference section for this notice.

The principal authors of this notice are Nelson Erickson of the Office of Vehicle Safety Standards, Crash Avoidance Division and Frederic Schwartz, Jr., of the Office of Chief Counsel.

In consideration of the foregoing, Standard No. 115, 49 CFR 571.115, is revised . . . .

(Secs. 103, 112, 119 Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.50.)

Issued on March 15, 1979.

Joan Claybrook
Administrator

44 F.R. 17489–17498
March 22, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 115

Vehicle Identification Number

(Docket No. 1-22; Notice 10)

ACTION: Response to petitions for reconsideration and rulemaking.

SUMMARY: This notice responds to a petition for reconsideration of the March 22, 1979, notice amending Federal Motor Vehicle Safety Standard No. 115, Vehicle Identification Number and to several petitions for rulemaking to amend the standard. The requests in the reconsideration petition to eliminate the fixed format required of vehicle identification numbers (VINs) for certain vehicle types and to place the check digit after the 3rd character of the VIN are denied. A rulemaking petition request to extend the date by which unique manufacturer identifiers must be reported to the agency is granted. Rulemaking petitions to postpone the standard's effective date for vehicles whose model year changeover date is subsequent to September 1, 1980, are granted in part. Requests for an interpretation permitting slight variations between actual engine horsepower and that encoded in the VIN are also answered. The effect of these amendments is to facilitate in various minor ways the manufacturer's implementation of the revised VIN.

DATES: The effective date of the standard is revised as follows: September 1, 1980, for manufacturers whose 1981 model year changeover date falls prior to September 2, 1980, or subsequent to January 1, 1981.

The manufacturer's 1981 model year changeover date for manufacturers whose changeover date for that year occurs between September 1, 1980, and January 2, 1981.

SUPPLEMENTARY INFORMATION: On March 22, 1979, the National Highway Traffic Safety Administration published a notice amending Federal Motor Vehicle Safety Standard No. 115, Vehicle Identification Number (44 FR 17489). One petition for reconsideration of the amended rule and several petitions for rulemaking to amend the rule further were received.

The vehicle identification number (VIN) is a series of 16 letters and numbers which serves as the unique identifier for motor vehicles manufactured in or imported into the United States. Along with its ability to uniquely identify a vehicle, the VIN can be decoded to provide substantial information about the vehicle such as its manufacturer, model, and gross vehicle weight rating. The VIN is assigned in conjunction with a check digit, which follows its 8th character. The check digit is the result of a mathematical process utilizing the characters of the VIN, and is used to detect errors in the transcription of the VIN from a vehicle to a written record or from record to record.

The many uses and users of the VIN have been described in detail in previous notices. In summary, the VIN is used as the key vehicle identifier by the NHTSA, manufacturers, insurance companies, and agencies of State governments. It is the keystone of vehicle recall campaigns, and is of great importance in safety research. It also has many other uses such as vehicle titling and recovery of stolen vehicles.

VIN Fixed Format

Sections 4.5.2 and 4.5.3 of Standard No. 115 specify the alphabetic or numeric nature of the characters occupying six positions in the VIN affixed to passenger cars and to multipurpose passenger vehicles and trucks with a GVWR of 10,000 pounds or less. The 4th and 5th characters are required to be alphabetic and the 6th, 7th, 11th and 12th characters are required to be numeric. The process of specifying the alphabetic or numeric nature of certain characters is called fixing the format, and is utilized to facilitate the recognition by clerks and others of errors in transcribed VINs at the earliest possible moment. For example, the appearance of an alphabetic character in the 7th position of a VIN with a fixed format would be a clear indication of a transcription error.

Volkswagen of America (Volkswagen) submitted a petition for reconsideration requesting the agency to delete the fixed format requirements for the VIN. In support of its position, Volkswagen points out, as it has in response to previous notices, that a fixed format is only useful when the error in transcription involves the substitution of the wrong type of character, i.e., alphabetic for numeric or vice versa. Substitution of erroneous characters of the same type, e.g., a "7" for a "9", would not be discovered. Likewise, Volkswagen points out that fixing the format for only lightweight trucks and lightweight multipurpose passenger vehicles results in confusion unless the weight of the vehicle is known. Volkswagen believes this occurs because some trucks and multipurpose passenger vehicles will have a fixed format (10,000 pounds GVWR or less) and others will not have a fixed format (more than 10,000 pounds GVWR). Thus, a "4" in the 4th position of a truck of 8,000 pounds GVWR would indicate an error, but the same number in the same position for a truck of 18,000 pounds GVWR might not represent an error. Finally, Volkswagen states that placing the check digit following the 8th character rather than the 3rd character as proposed in Notice 7 (43 FR 52268) limits the use of the 2nd and 3rd sections of the VIN as one informational unit, further restricting its utility. Volkswagen requested, therefore, that the check digit be placed after the 3rd character.

As the NHTSA explained in Notice 7 (43 FR 52258) and Notice 8 (44 FR 17489), the use of the check digit process identifies almost all VIN transcription errors. Nonetheless, the use of the check digit also requires a mechanical processor of some kind; the mathematical steps cannot be carried out in an individual's head. An important segment of VIN users, particularly motor vehicle administrators and the insurance industry, believe it important that some process exist which will allow clerks and others at the time of entry of the VIN into the data processing system to check with the individual providing the VIN if an error has been made in transcription. Without this ability, a State agency receiving an erroneous VIN would be faced with having to take the time and trouble to locate and contact the individual who provided the VIN instead of being able to consult with the individual on the spot and correct the error. The Agency adopted the fixed format to meet this need, although it acknowledges that few errors will be discovered which could not be discovered at a later stage by utilizing the check digit procedure. Volkswagen has presented no information which would alter the agency's determination in this regard.

The Agency has concluded that the usefulness of the fixed format system will not be compromised by mandating its use only for those trucks and miltipurpose passenger vehicles whose GVWR is 10,000 pounds GVWR or less. The number of erroneous transcriptions for trucks and multipurpose passenger vehicles of more than 10,000 pounds GVWR should be small, as these vehicles do not make up a substantial portion of the vehicle population. Should any confusion arise, either the supplementary information submitted on the form along with the VIN or a direct question to the still-available transcriber would resolve the matter.

The NHTSA has also denied Volkswagen's petition concerning check digit location. While placing the check digit after the 8th character does separate the second and third sections of the VIN, it is clear that the third section changes with each vehicle since this section contains the vehicle's sequential number. The first and second sections, however, remain constant among large numbers of vehicles since they reflect general characteristics. Consequently, the agency reaffirms its conclusions that the check digit should follow the 8th character to maintain the integrity of the first and second sections of the VIN and to allow for the prestamping of those sections when appropriate.

Effective Date

The Recreational Vehicle Industry Association (RVIA) submitted a petition for rulemaking on

August 16, 1979, requesting a 3-month extension of the date by which manufacturers must submit unique identifiers to the agency. The date established by the March 22, 1979, notice for submission of the identifiers was September 1, 1979. RVIA based its petition on the reported confusion of some of its members concerning the unique identifiers and on its then recent learning that NHTSA had awarded a contract to the Society of Automotive Engineers to act as the agency's agent in acknowledging and/or assigning unique identifiers to manufacturers.

To ensure widespread public knowledge and understanding of the SAE contract and the SAE's role in the assigning of manufacturer identifiers, the agency published a notice announcing the contract in the *Federal Register* (44 FR 52783; September 10, 1979). In particular, the notice stated that:

The SAE is the assigner of World Manufacturer Identifiers on behalf of the International Standards Organization. As such, it has assigned more than 700 three character identifiers to motor vehicle manufacturers. These identifiers have been submitted to the NHTSA pursuant to S4.5.1 and S6.1. In assigning these identifiers, the SAE has gained considerable experience in the process of manufacturer identification. For this reason, the agency has determined that it would be more efficient and effective to contract with the SAE to act as its agent in acknowledging and/or assigning manufacturer identifiers to the remaining vehicle manufacturers.

All requests for the manufacturer identifiers should be forwarded directly to: Society of Automotive Engineers, 400 Commonwealth Avenue, Warrendale, Pennsylvania 15096, Attention: Leo Ziegler.

Manufacturer identifiers will be supplied at no charge. Manufacturers need not request a particular identifier. Requests for the assignment of specific identifiers can be forwarded to the SAE, however, and these identifiers will be assigned by SAE if they do not conflict with an identifier already reserved. Identifiers supplied directly to the agency by manufacturers have been forwarded to the SAE.

Manufacturer identifiers assigned by the SAE need not be submitted to the NHTSA. The NHTSA, of course, retains final authority over the assignment process, and any questions should be referred to the agency.

The agency has decided to change the deadline for submission of the manufacturer identifiers from September 1, 1979, to February 24, 1980, to ensure that all manufacturers have sufficient time to work with the SAE in the selection and submission of their identifiers. In making this change, a major consideration of the agency is that the change has no effect on the implementation of the revised VIN for the 1981 model year. Since this change relieves a restriction and does not adversely affect parties which will utilize the revised VIN, the agency has determined that notice and comment are not necessary.

Fruehauf Corporation (Fruehauf) and Rolls-Royce Motors International (Rolls-Royce) have submitted petitions for rulemaking to amend Standard No. 115 by extending the effective date. Rolls-Royce has requested that it not be required to affix the VIN mandated by the standard until its model year changeover date which will occur prior to January 1, 1981, and subsequent to the current effective date of September 1, 1980. Fruehauf has requested that the effective date be made January 1, 1981, as that is its model year changeover date.

Both manufacturers present a number of financial and technical arguments in support of their petition. Fruehauf faces a particular problem in this regard, as the firm is currently installing a new computer system. Since orders for heavy trucks are now being accepted for delivery after September 1, 1980, the company will be obligated to assign to each of these vehicles the current 9 character VIN and the 16 character plus check digit VIN required by Standard No. 115. This will also require either programming the new computer to manipulate both a 9 and 17 character VIN, or maintaining the old computer system in parallel with the new system for three additional months. Regardless of the technical method chosen to solve this problem, Fruehauf will also incur the cost of training its personnel to deal with the dual system. Fruehauf estimates its cost associated with this problem to be $231,000.

Fruehauf also argues that use of two VIN systems during the same model year gives rise to a number of physical and logistical problems. If two systems are to be used, it must determine if a vehicle when ordered is to be produced prior to

September 1, 1980 (in which case it would be assigned a 9 character VIN), between September 1, 1980 and January 1, 1981 (in which case it would be assigned both a 9 character VIN and a 17 character VIN), or after January 1, 1981 (in which case it would be assigned a 17 character VIN). Delays or alterations in the manufacturing sequence could cause substantial complications. Since the VIN is used for a number of purposes during the manufacturing process, intracompany forms would also have to be redesigned to indicate both VINs. Further, customer invoices and manufacturing documentations would have to utilize the 17 character VIN, but internal cost, accounting and recordkeeping would have to utilize the 9 character VIN.

The petition of Rolls-Royce articulated similar problems. Of particular concern to Rolls-Royce were problems involving recordkeeping, service reporting, production and general confusion arising from the need to alert personnel to the changes and use of the two different VIN systems for the same model year.

The agency has concluded that these petitions should be granted, to the extent described below. The initial effective date of September 1, 1980, for Standard No. 115 was chosen by the agency because this is the model year changeover date for most vehicles manufactured in the United States. The agency considers it extremely important that this date not be delayed to avoid the problems inherent in effecting a new VIN system in the midst of a model year.

For this very reason, however, the agency is concerned that the use of two entirely different VIN systems by some manufacturers for the same model year will result not only in the problems suggested in the Fruehauf and Rolls-Royce petitions, but also will give rise to confusion in recall campaigns and other areas. Likewise, the agency is concerned about the added costs necessitated by VIN users having to maintain two separate VIN systems, and the means to decode these systems, for the same model year. Further, additional costs to implement the standard will result from the inability of these manufacturers and others similarly situated to coordinate the changes required by the standard with other changes normally made to their vehicles on the model year changeover date.

The agency has also concluded that any adverse effect on safety of a modified effective date for manufacturers whose model year changeover date falls between September 1, 1980, and January 1, 1981, will be negligible, and outweighed by the safety benefits. The number of vehicles which will be affected is small, and the VIN currently used by the manufacturers will be continued in place for the several months involved in the amendment. For these reasons, the agency has concluded that the effective date for Standard No. 115 for manufacturers whose model year changeover date falls between September 1, 1980 and January 2, 1981, should be that model year changeover date. The effective date for all other manufacturers remains September 1, 1980.

Engine Horsepower Rating

American Honda Motor Co., Inc. (Honda) and Volkswagen have asked the agency to interpret the requirement that engine net horsepower be decipherable from the VIN to allow for a slight variation in the actual horsepower from that reported to the agency.

Table 1 of S4.5.2 of Standard No. 115 sets forth the information for each type of vehicle which must be decipherable from the VIN. Except for trailers, the VIN for all types of vehicles must encode "engine type". "Engine type" is defined in S3 of the standard as "a power source with defined characteristics such as fuel utilized, number of cylinders, displacement, and net brake horsepower." In addition, the VIN for motorcycles must reflect net brake horsepower.

Honda and Volkswagen have pointed out to the agency that a particular engine's horsepower may vary slightly from others of the same manufacturer and model depending upon its method of installation. The agency has also been informed in comments to the docket that engines which are essentially the same, particularly in trucks, may have slightly differing horsepower ratings depending on the requirements of the ultimate purchaser of the vehicle. Further, in the case of Honda, the difference may be as great as 20 percent because of engine modifications to meet necessary requirements of the State of California. To encode in the VIN slight differences in horsepower ratings would be an inefficient use of its information carrying capacity, the manufacturers argue.

The NHTSA concurs in this evaluation. The purpose of the horsepower rating requirement is to obtain information for accident and fuel economy research, and it is not necessary to have precise horsepower ratings for these purposes. Consequently, the agency is amending the standard to provide that the value for engine net brake horsepower encoded in the VIN may differ, with one exception, by 10 percent from the actual net brake horsepower. Motorcycles whose horsepower rating is 2 brake horsepower or less may not be indicated as being above that rating and motorcycles whose horsepower rating is above 2 brake horsepower must so indicate. The purpose of this exception is to preserve the distinction in the VIN between motorcycles and mopeds. It should also be noted that the permissible deviation margin cited above is only authorized for Standard No. 115, and does not apply to other standards.

The agency has considered the economic impact of this final rule and determined that it is not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency has determined further that the impact is so minor as not to require preparation of a written evaluation of it. This is because the amendments impose no new costs upon manufacturers and seeks to lessen the difficulties of compliance with the Standard.

The principal authors of this notice are Frederic Schwartz, Jr. of the Office of Chief Counsel and Nelson Erickson of the Office of Vehicle Safety Standards.

In consideration of the foregoing, Standard No. 115, 49 CFR 571.115, is amended as follows:

1. Table I in S4.5.2 is amended to read as follows:

Table I—Type of Vehicle and Information Decipherable

Passenger car: Line, series, body type, engine type,[1] and restraint system type.

Multipurpose passenger vehicle: Line, series, body type, engine type,[1] and gross vehicle weight rating.

Truck: Model or line, series, chassis, cab type, engine type,[1] brake system and gross vehicle weight rating.

Bus: Model or line, series, body type, engine type,[1] and brake system.

Trailer: Type of trailer, series, body type, length, and axle configuration.

Motorcycle: Type of motorcycle, line, engine type,[1] and net brake horsepower.[1]

Incomplete vehicle: Model or line, series, cab type, engine type,[1] and brake system.

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[1] Engine net brake horsepower encoded in the vehicle identification number shall differ by not more than 10 percent from the actual net brake horsepower; shall, in the case of a motorcycle with an actual net brake horsepower of 2 or less, not be more than 2; and shall, in the case of a motorcycle with an actual brake horsepower greater than 2, be greater than 2.

2. S6.1 is revised to read as follows: S6.1 Manufacturers of motor vehicles subject to this standard shall submit, either directly or through an agent, the unique identifier for each make and type of vehicle it manufactures by February 24, 1980.

Issued on February 19, 1980.

Joan Claybrook,
Administrator
45 F.R. 12255
February 25, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 115

Vehicle Identification Number

(Docket No. 1-22; Notice 12)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standard No. 115, *Vehicle Identification Number,* by deleting portions of that standard and reissuing those portions as a general agency regulation. This is being taken in response to a petition from the Motor Vehicle Manufacturers Association (MVMA). It is intended to assure that the recall and remedy provisions of the National Traffic and Motor Vehicle Safety Act ("the Act") do not apply to certain errors in vehicle identification numbers (VIN's) which are minor and have no safety consequences. The basic substantive requirements of Standard 115 are unchanged by this action.

DATES: This action is effective 30 days after publication in the *Federal Register.*

SUPPLEMENTARY INFORMATION: The VIN is that unique number assigned each vehicle during production by the manufacturer for purposes of identification and inventory control. The VIN has other users. A variety of other organizations use the VIN for such purposes as vehicle registration, insurance rating, and theft investigation. NHTSA uses the VIN in its safety research and investigation activities.

In 1968, Federal Motor Vehicle Safety Standard (FMVSS) 115 was adopted, specifying that each passenger car must be assigned a unique VIN. In 1979, FMVSS 115 was extended to cover motor vehicles other than passenger cars. Also, a uniform, 17-character format for VIN's was then established, specifying coded information such as the identity of the manufacturer, vehicle make, type of vehicle, various vehicle attributes, model year, plant of manufacture, and production sequence. The VIN also contains a check digit which aids in the detection of errors in the transcription of VIN's by the users of the numbers.

On June 13, 1980, MVMA petitioned this agency to withdraw FMVSS 115 and reissue its provisions in the form of a general agency regulation. The significance of this change stems from section 152 of the Act (15 U.S.C. 1412), which provides that whenever the Secretary of Transportation determines that a vehicle does not comply with a FMVSS, the Secretary must require the vehicle's manufacturer to notify the owners, purchasers, and dealers of the vehicle of that noncompliance and to remedy the noncompliance. However, in the case of a noncompliance with a regulation other than a FMVSS, the notification and remedy requirements of the Act do not apply. For those noncompliances, more flexible methods of enforcement are permitted.

MVMA sought to assure through its requested amendment that errors in the assignment of VIN's would not trigger the recall and remedy provisions of the Act. Requiring that errors in assigned VIN's must be physically corrected would be undesirable in most cases for two reasons. First, correcting the errors would be an expensive and burdensome process, whose possible benefits would be greatly outweighed by the costs. These burdens and costs are discussed in the NPRM. In most cases, simply providing information on the nature of the error to users of the VIN's would solve any problems caused by the incorrect VIN. Second, changing a previously assigned VIN could create antitheft problems. Law enforcement authorities consider the presence of an altered VIN in a vehicle to be an indication that the vehicle has been stolen. If VIN's were frequently altered lawfully, it would be more difficult for the police to detect stolen vehicles.

Further, if the equipment necessary to alter VIN's were widely available (such as at all auto dealers, as might be necessary to conduct a recall and remedy campaign), thieves' access to such equipment would be greatly increased. Law enforcement authorities have consistently recommended to NHTSA that VIN numbers, once assigned, should not be altered for any reason, even if the original number was incorrect.

The only exception to the recall requirement is contained in section 157 of the Act (15 U.S.C. 1417) which authorizes exemptions from these requirements based on a demonstration that the noncompliance is inconsequential as it relates to safety. This authority could be used to relieve a manufacturer of the necessity of conducting a recall and remedy campaign to correct minor VIN errors. Minor labeling errors were among the examples given in the legislative history of the provision for the sorts of errors that are inconsequential. While exemptions might well be given under section 157 for minor VIN errors, the necessity of conducting the exemption proceedings for such errors imposes an excessive administrative burden. The amendments made by this notice eliminate that burden.

MVMA suggested that one possible consequence of a change in the status of the VIN provisions might be a loss or narrowing of Federal preemption. Under section 103(d) of the Act (15 U.S.C. 1392(d)), whenever a FMVSS is in effect, no State may establish or maintain a requirement applicable to the same aspect of performance unless the State requirement is identical to the FMVSS. The removal of various VIN requirements from FMVSS 115 removes them also from the operation of section 103(d). Recognizing this and the clear undesirability of having differing VIN requirements established by the States, MVMA modified its petition on April 18, 1982. In its modified petition, MVMA requested that only certain VIN provisions be shifted from the standard to the regulation. Requirements establishing the fundamental characteristics of the VIN, such as its length, location, and readability, would remain in the standard. Under the amended petition, the content of the VIN would be specified in the VIN regulation. The combined standard/regulation scheme is intended to remove the threats of potentially costly recall campaigns to correct minor VIN errors or of inconsequentiality proceedings, while ensuring that the preemptive effect of the FMVSS is still maintained for the more significant requirements.

After reviewing the MVMA petition, the agency tentatively concluded that MVMA's suggested regulatory changes have merit, and proposed to adopt those changes. See 47 FR 42004, September 23, 1982. (The agency believes that general principles of Federal preemption are sufficient to assure that the VIN regulation will preempt any inconsistent State requirements.) Based on further review of that petition and the comments received on the September notice of proposed rulemaking (NPRM), the agency is herein adopting these changes in final form.

Comments on the NPRM

Virtually all the comments received on the September NPRM supported the proposed changes to FMVSS 115. However, several commenters suggested slight changes or clarifications to the proposed regulatory language. The most controversial aspect of the proposal was the provision which would exempt from certain VIN requirements vehicles imported into the United States under bond, which do not meet U.S. standards, but which will subsequently be modified to meet those standards. As a practical matter, this provision applies to individuals or organizations which import small numbers of vehicles. Several commenters expressed the fear that this provision could result in the importation of large numbers of vehicles (such as by a foreign manufacturer) with nonconforming VIN's. These commenters suggested that the exemption be limited to a maximum of 5 vehicles per year per individual. While the agency agrees that the exemption should not be applied to an actual manufacturer, it cannot justify selecting any particular arbitrary limit, such as five vehicles, to exclude larger commercial organizations. However, in response to these comments, the agency is amending this provision to exclude actual manufacturers of vehicles and their subsidiaries.

Several commenters also suggested that information on VIN errors should be provided to the National Crime Information Center (NCIC, part of the Federal Bureau of Investigation) and the National Automobile Theft Bureau (NATB, a private organization affiliated with the insurance industry). These organizations could enter the information in their computer systems, thereby making it available to State motor vehicle administrations, law enforcement organizations, and other

VIN users. The agency agrees that taking this step would help assure that VIN users would have complete and accurate information on the VIN's which are actually assigned by the vehicle manufacturers. Accordingly, NHTSA will establish an internal procedure for routinely transmitting VIN error information to NCIC and NATB.

Most commenters also suggested that the agency define the term "trailer kit" and specify in the regulation the agency's previously established policy, i.e., that trailer kits are subject to the same VIN requirements as trailers. The agency believes that making these changes is appropriate, and is adopting a definition of trailer kits based on language in 49 CFR 567.4(g). "Trailer kits" are defined as a trailer which is delivered in complete but unassembled form, and which can be assembled without special machinery or tools.

MVMA suggested that the "trailer kit" definition should be added to the definitions in the beginning of Part 571. Taking that action would not serve any present purpose, since the term is apparently not used in any other FMVSS. MVMA also suggested incorporating all the definitions in Part 571 into FMVSS 115. The agency sees no need for this change, and making the change could have unintended effects, such as where a term's definition in one standard is inappropriate for use in FMVSS 115. Therefore, these recommendations were not adopted.

The International Association of Chiefs of Police and the NATB also suggested that the agency define the term "glider kit" and specify that VIN requirements are applicable to glider kits. Typically, a glider kit is a new truck cab, frame rails, and front suspension without drive train (engine, transmission, and rear axle). The treatment of combinations of new and used components in a single vehicle is currently specified in 49 CFR 571.7. Under that provision, the addition of a new cab, frame rail, and front suspension is deemed to create a new vehicle subject to all applicable safety standards in effect as of the date of remanufacture, unless the engine, transmission, and drive axle (as a minimum) of the assembled vehicle are not new and at least two of those listed components were taken from the same vehicle. Thus, in many situations, the use of a new glider kit would not require that a new VIN be affixed to the assembled vehicle. Further, it would be difficult for the glider kit manufacturer to assign a VIN, as suggested by the two commenters, since a truck VIN must contain coded information regarding the engine type, and the glider kit manufacturer would not generally know what type of engine would be used with a particular kit. Therefore, the agency is not adopting the provisions suggested by these two commenters, and will instead rely on the existing regulations for dealing with glider kits.

The Iowa Department of Transportation objected to the practice of some motorcycle manufacturers of stamping a portion of the VIN on motorcycle frames. The Iowa agency points out that this practice could cause confusion as to which number is the actual VIN. NHTSA has taken the position that, so long as the vehicle manufacturer complies with all requirements in FMVSS 115 with regard to the specified 17 character number, these manufacturers may affix other numbers to the motorcycles for their own purposes. Currently, NHTSA cannot justify altering this policy. However, should we become aware of substantial numbers of incidents where the use of this supplementary number has undermined the Federal VIN system, we may consider prohibiting these supplementary numbers, requiring that supplementary numbers must be the same 17 character number as the VIN, or some clarifying labeling where other than the VIN is used. The NCIC objected to the exemption of farm equipment from VIN requirements. The VIN requirements, like all of the FMVSS, apply only to "motor vehicles", i.e., vehicles which are manufactured primarily for use on the public roads, consistent with the scope of the agency's regulatory authority under the Act. See section 102(3) of the Act. The agency lacks the authority to regulate vehicles which are principally used off the public roads, such as the vehicles cited by these two commenters. Should the States decide to apply VIN requirements to such vehicles as a matter of State law, NHTSA would have no objection.

Ford Motor Company and the MVMA pointed out that the requirement that VIN's affixed to vehicles must have a letter height of at least 4 millimeters should only apply to passenger cars and trucks with a gross vehicle weight rating of 10,000 pounds or less as the requirement has ever since it was established. In the NPRM, this requirement was inadvertently applied to all motor vehicles. The error is corrected in the final rule.

MVMA also requested that the new VIN regulation maintain the requirement that, for manufacturers of under 500 vehicles per year, the third character of the VIN must be the number 9. The agency deleted this provision, since prior to its amendment today, FMVSS 115 gave the erroneous impression that vehicle manufacturers selected the world manufacturer identifier (WMI) portion of their VIN's. In fact, the Society of Automotive Engineers assigns those characters for U.S. manufacturers. The deletion of the phrase specifying the third character of the VIN for small manufacturers in no way changes the intended numbering system—SAE will continue to assign WMI's as it has in the past.

The American Association of Motor Vehicle Administrators has requested that NHTSA reemphasize that vehicle manufacturers must submit and update deciphering information on their VIN systems. This final rule continues to provide that at least 60 days prior to affixing any VIN, or, when information is unavailable at that time, within one week after it becomes available, each manufacturer must submit information necessary to decipher its VIN system. This requirement, which has been in effect since January 1981, applies to both the original submission of deciphering information and to updates of that information as new products are offered by the manufacturer. It is the manufacturer's responsibility to assure that deciphering information provided to NHTSA is current.

Ford Motor Company argued that sections 108 and 152 of the Act, which the agency listed as part of the legal authority for the new VIN regulation, are not appropriate authority for this action. Section 108 was cited as authority merely to point out that, in conjunction with the reference to section 112 as authority for the action, failure to comply with the VIN regulation would be enforceable as a violation of section 108(a) (1) (E) of the Act. The reference to section 152 is included to point out the regulation is issued to facilitate carrying out the recall provisions of section 152 of the Act. The NPRM should also have included (and this final rule includes) a reference to the safety research authority of section 106 of the Act, a major use of the VIN information.

This action is being made effective 30 days after publication in the *Federal Register*. This relatively expedited effective date is in the public interest since it will quickly remove the potential problem of unwarranted VIN-related recalls.

The principal impact of this action is to remove this threat of an unduly burdensome recall requirement to correct VIN errors. The new Part 565 would not have any requirements not in FMVSS 115 prior to today. The agency anticipates that the manufacturers will continue to assign VIN's in the same manner regardless of whether VIN requirements take the form of a safety standard or a regulation. Further, the agency anticipates that the corrective action required in case of erroneous VIN's would not essentially differ as a result of this proposed change, since only in extreme cases can the agency envision having to order a vehicle recall.

This action should have a small positive impact on foreign trade, since it removes the threat to foreign manufacturers of a potentially burdensome recall campaign to correct minor VIN errors. Also, the exemption of vehicles imported under bond will have a small positive impact on foreign trade.

The agency has concluded that the environmental consequences of this action will be of such limited scope that they clearly will not have a significant effect on the quality of the human environment; that this proposal does not qualify as a "major rule" within the meaning of Executive Order 12291; and that due to its minimal cost impacts, this rule is not "significant" within the meaning of the Department's regulatory procedures. Therefore, preparation of neither a regulatory analysis nor full regulatory evaluation is necessary for this action. The agency notes this rulemaking action should have a small, positive impact on small firms—particularly small manufacturers and small importers. This regulation provides relief to small manufacturers from the generally applicable 60-day VIN prenotification requirements in the case of orders for unique vehicle configurations. The agency is also exempting small importers (principally individuals importing one vehicle for their own use) from certain VIN format and content requirements. Given the relatively minor economic consequences of these changes, I certify that this action will have no significant economic impact on a substantial number of small entities, including small organizations or governmental units. These changes should have no impact on vehicle prices. For this reason and because VIN's will continue to be assigned to new vehicles as before, the agency does not anticipate any impacts on small organizations or governmental units. Accordingly, no Regulatory Flexibility Analysis has been prepared.

For the reasons stated above, the agency is amending Chapter V of Title 49 of the Code of Federal Regulations by adding a new Part 565.

Issued May 13, 1983.

Raymond A. Peck, Jr.,
Administrator

48 F.R. 22567
May 19, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 115

Vehicle Identification Number

[Docket No. 1-22; Notice 13]

ACTION: Correction.

SUMMARY: On May 19, 1983, the agency published an amendment to Standard No. 115, *Vehicle Identification Number.* The amendment exempted from certain of the vehicle identification number (VIN) requirements vehicles imported into the United States under bond which do not meet U.S. standards at the time of importation, but which subsequently will be modified to meet those standards. This notice corrects a typographical eror in that amendment, in order to clarify the specific provisions from which such importers are exempted.

EFFECTIVE DATE: January 30, 1985.

SUPPLEMENTARY INFORMATION: On May 19, 1983 (48 FR 22567), NHTSA published a rule amending Federal Motor Vehicle Safety Standard (FMVSS) No. 115, *Vehicle Identification Number.* That amendment, made in response to a petition filed by the Motor Vehicle Manufacturers Association, took certain portions of the existing FMVSS and placed those provisions in a separate agency regulation. This change was intended to remove the possibility that certain minor VIN errors regarding the format and content of the number would trigger the recall and remedy provisions of the National Traffic and Motor Vehicle Safety Act (which apply to violations of an FMVSS but not to violations of a general regulation). While the May amendment left the basic substantive VIN requirements unchanged, one substantive amendment was implemented in that notice. That amendment exempted from most VIN requirements vehicles which do not meet U.S. standards imported into the United States under bond (except by the actual manufacturer of the vehicle or a subsidiary thereof), but which will subsequently be modified to meet those standards. (These vehicles will be referred to herein as "bonded imports.") Bonded imports are still required to have a vehicle identification number assigned by the manufacturer and affixed to the vehicle in a specified location. (Volkswagen has filed a petition for reconsideration of the amendment, which is being reviewed by the agency.)

Due to a typographical error involving the omission of a clause and section numbering changes that occurred in the period between the agency's proposal and issuance of the final rule, there has been some confusion with regard to the precise scope of the bonded-import exemption. This notice amends FMVSS 115 to make clear that bonded imports are exempt only from the standard's requirement that each VIN have 17 characters in a specified format and check digit. Bonded imports must still have a unique VIN assigned by the assembling manufacturer which is permanently affixed to the vehicle, and is clearly legible. This notice also corrects the standard to specify that the exemption does not apply to an assembling manufacturer or its subsidiary. The preamble to the final rule explained that change, but it was not incorporated into the text of the standard.

The corrections to FMVSS 115 made in this notice will be effective immediately on publication in the *Federal Register.* The agency finds good cause for determining that notice and comment on this amendment are not necessary. Likewise, the agency finds good cause for an immediate effective date within the meaning of 5 U.S.C. 553(d) and finds that such an effective date is in the public interest within the meaning of 15 U.S.C. 1392(e). The basis for the findings of good cause is that the amendment corrects an obvious error in the rule as originally promulgated and should not adversely affect the ability of importers to comply with the standard.

For the reasons stated above, the agency is amending Title 49 of the Code of Federal Regulations, by revising Part 571.115, *Vehicle Identification number,* as follows:

Standard 115: Vehicle identification number—basic requirements.

1. Paragraph S1 is amended by removing the second sentence of that paragraph, which reads as follows: "Vehicles * * * standard."

2. Paragraph S2 is amended by adding a new second sentence to read as follows: Vehicles imported into the United States under 19 CFR 12.80(b)(1)(iii), other than by a corporation which was responsible for the assembly of that vehicle or a subsidiary of such a corporation, are exempt from the requirements of S4.2, S4.3, and S4.7 of this standard.

Issued on January 22, 1985.

Diane K. Steed
Administrator

50 FR 4221
January 30, 1985

MOTOR VEHICLE SAFETY STANDARD NO. 115

Vehicle Identification Number—Basic Requirements

S1. Purpose and Scope.

This standard specifies general physical requirements for a vehicle identification number (VIN) and its installation to simplify vehicle information retrieval and to reduce the incidence of accidents by increasing the accuracy and efficiency of vehicle recall campaigns.

S2. Application.

This standard applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers, (including trailer kits), incomplete vehicles and motorcycles. [Vehicles imported into the United States under 19 CFR 12.80(b)(1)(iii), other than by a corporation which was responsible for the assembly of that vehicle or a subsidiary of such a corporation, are exempt from the requirements of S4.2, S4.3, and S4.7 of this standard. (50 F.R. 4221—January 30, 1985. Effective: January 30, 1985)]

S3. Definitions.

"Check digit" means a single number or the letter X used to verify the accuracy of the transcription of the vehicle identification number.

"Incomplete vehicle" means an assemblage consisting, as a minimum, of frame and chassis structure, power train, steering system, suspension system, and braking system, to the extent that those systems are to be part of the completed vehicle, that requires further manufacturing operations, other than the addition of readily attachable components, such as mirrors or tire and rim assemblies, or minor finishing operations such as painting, to become a completed vehicle.

"Manufacturer" means the entity responsibility for affixing the vehicle's certification label.

"Trailer kit" means a trailer which is fabricated and delivered in completed and delivered in complete but unassembled form and which is designed to be assembled without special machinery or tools.

"Vehicle identification number" means a series of arabic numbers and roman letters which is assigned to a motor vehicle for identification purposes.

S4. Requirements.

S4.1 Each vehicle manufactured in one stage shall have a VIN that is assigned by the manufacturer. Each vehicle manufactured in more than one stage shall have a VIN assigned by the incomplete vehicle manufacturer. Vehicle alterers, as specified in 49 CFR 567.7, shall utilize the VIN assigned by the original manufacturer of the vehicle.

S4.2 Each VIN shall consist of seventeen (17) characters.

S4.3 A check digit shall be part of each VIN. The check digit shall appear in position nine (9) of the VIN on the vehicle and on any transfer documents containing the VIN and prepared by the manufacturer to be given to the first owner for purposes other than resale.

S4.4 The VIN's of any two vehicles manufactured within a 30-year period shall not be identical.

S4.5 The VIN of each vehicle shall appear clearly and indelibly upon either a part of the vehicle other than the glazing that is not designed to be removed except for repair or upon a separate plate or label which is permanently affixed to such a part.

S4.6 The VIN for passenger cars, multipurpose passenger vehicles, and trucks of 10,000 pounds or less GVWR shall be located inside the passenger compartment. It shall be readable, without moving any part of the vehicle, through the vehicle glazing under daylight lighting conditions by an observer having 20/20 vision (Snellen) whose eye-point is located outside the vehicle adjacent to the left windshield pillar. Each character in the VIN subject to this paragraph shall have a minimum height of 4 mm.

S4.7 Each character in each VIN shall be one of the Arabic or Roman letters set forth in Table 1.

Table 1

Numbers:
1 2 3 4 5 6 7 8 9 0

Letters:
A B C D E F G H I J K L M N P R S T U V W X Y Z

All spaces provided for in the VIN must be occupied by a character specified in Table 1.

S4.8 The type face utilized for each VIN shall consist of capital, san serif characters.

43 F.R. 36452
August 17, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 70–23; Notice 3)

This notice amends § 571.21 of Title 49, Code of Federal Regulations, Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, to establish new performance requirements for brake fluid, and to extend its application to all motor vehicles equipped with hydraulic brake systems, and to all brake fluid for use in hydraulic brake systems of motor vehicles. The amendment also establishes requirements for brake fluid containers and labeling of containers.

A notice of proposed amendment to Federal Motor Vehicle Safety Standard No. 116 was published on September 30, 1970 (35 F.R. 15229). Interested persons have been afforded an opportunity to participate in the rulemaking process and their comments have been carefully considered.

The amendment adopts requirements that were proposed for grades DOT 3 and DOT 4 brake fluid, eliminates SAE Type 70R1 brake fluid, specifies more stringent requirements for physical and chemical properties, specifies the use of SAE SBR wheel cylinder cups in testing, and sets forth requirements for brake fluid containers and brake fluid container labeling.

Comments and available data indicated that the proposed DOT 2 type brake fluid is not a commercially available fluid but is manufactured primarily for military use in Arctic regions and that there is no current need for this additional grade of brake fluid. DOT 2 brake fluid has therefore been excluded from the amendment.

Requirements for DOT 3 and DOT 4 grade fluids are adopted as proposed, with a minor modification in the wet boiling point of the DOT 4 grade fluid. The NHTSA has determined that there is a need for two grades of brake fluid until an all-weather fluid is developed with viscosity and boiling point characteristics suitable for use in all braking systems. In order to provide an added margin of protection against vapor locking in severe braking service, some car manufacturers may wish to recommend use of a DOT 4 fluid for certain severe conditions. Such recommendations should point out that use of the DOT 4 fluid for improved resistance to vapor locking may result in poorer system performance in very cold weather.

The wet equilibrium reflux boiling point test procedure has been adopted as it represents a measure of the capability of the fluid in service. Tests have been run and data accumulated which demonstrate that this test is sufficiently repeatable to justify its inclusion. However, when sufficient data become available on methods of measuring resistance to vapor lock, this agency may consider proposing a new test procedure.

The proposed low temperature viscosity requirements for the DOT 3 and DOT 4 grade fluids have been adopted unchanged. Adequate data exist to support the need for the specified kinematic viscosities at low temperatures to assure adequate brake system performance in cold weather. Since high boiling points are sacrificed for low viscosities at low temperatures, the differences in kinematic viscosities between DOT 3 and DOT 4 grade fluids are justifiable.

The flash point test proposal has not been adopted because comments indicated that the test is not pertinent to in-use performance characteristics. The NHTSA, however, may reexamine the potential flammability hazard posed by motor vehicle brake fluids at a later date, particularly in the event that central hydraulic systems are introduced.

Brake fluid containers with a capacity of six ounces or more must be provided with a resealable closure to reduce the likelihood of contamination after the initial opening.

The labeling requirements as adopted do not require, in all instances, that the manufacturer's name be placed upon the container. Many comments indicated that the manufacturer cannot be held resposible for the quality of a fluid once it has been transferred to a packager who may contaminate or alter the fluid, and the NHTSA concurs. However, the manufacturer, when he is not the packager, will be required to certify compiance to the packager. The packager will be required to state the name of the manufacturer and the distributor on the container label, either directly or in code. He wil be required also to affix a number identifying the packaged lot and date of packaging. It is expected that packagers will keep records sufficient to provide the NHTSA with all identifying information when such is requested. The safety warnings have been reworded to avoid misinterpretations.

Several comments indicated that the proposed effective date of October 1, 1971 would place a hardship on packagers who deal solely in the aftermarket, alleging that lithographed cans must be purchased in quantity. Accordingly, an effective date of March 1, 1972, has been adopted to offer sufficient lead time to insure that all motor vehicle brake fluids manufactured on and after that date will be packaged in containers which meet requirements also effective March 1, 1972.

Petroleum-based fluids are no longer exempted from meeting the requirement of this standard. However, the NHTSA realizes that some manufacturers wish to use these fluids in central power systems and is issuing today an advance notice of proposed rulemaking requesting comments for a suitable performance standard for petroleum-based fluids (Docket No. 71-13; 36 F.R. 12032).

Test procedures adopted are, in general, similar to current ASTM Methods, with SAE Standards J1702b and J1703b as reference sources. ASTM Methods consulted in developing the test procedures include: E 298–68 "Assay of Organic Peroxides," D 1120–65 "Boiling Point of Engine Antifreezes," D 1121–67 "Reserve Alkalinity of Engine Antifreezes and Antitrusts," D 2240–68 "Indentation Hardness of Rubber and Plastics by Means of a Durometer," D 344–39 "Relative Dry Hiding Power of Paints," D 97–66 "Pour Point," D 1415–68 "International Hardness of Vulcanized Natural and Synthetic Rubbers," E 1–68 "ASTM Thermometers," E 77–66 "Verification and Calibration of Liquid-In-Glass Thermometers," D 2515–66 "Kinematic Glass Viscometers," E 70–68 "pH of Aqueous Solutions with the Glass Electrode," E 29–67 "Indicating Which Places of Figures are to be Considered Significant in Specified Limiting Values," D 1123–59 "Water in Concentrated Engine Antifreezes by the Iodine Reagent Method," D 445–65 "Viscosity of Transparent and Opaque Liquids (Kinematic and Dynamic Viscosities)," D 91–61 "Precipitation Number of Lubricating Oils," and E 96–66 "Water Vapor Transmission of Materials in Sheet Form." SAE Referee Materials (SAE RM) used in testing may be obtained from the Society of Automotive Engineers, Inc., Two Pennsylvania Plaza, New York, N.Y. 10001.

Effective date: March 1, 1972.

In consideration of the foregoing, 49 CFR 571.21, Federal Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, is amended.

. . .

Issued on June 16, 1971.

Douglas W. Toms
Acting Administrator

36 F.R. 11987
June 24, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 70–23; Notice 4)

Motor Vehicle Safety Standard No. 116, establishing requirements for motor vehicle brake fluids and containers was amended on June 24, 1971 (36 F.R. 11987). Corrections were published on August 11, 1971 (36 F.R. 14742) and August 17, 1971 (36 F.R. 15534). Pursuant to 49 CFR 553.35 (35 F.R. 5119) petitions for reconsideration of the amendment were filed by Automotive Parts and Accessories Association, Inc., Citroen S.A., General Motors Cohporation, R. M. Hollingshead Corporation, Union Carbide Corporation, and Wagner Electric Corporation. Subsequently, requests for rulemaking were received from Gold Eagle Products Co., and Union Carbide.

In response to information contained in several of the petitions, and to data recently available to the Administrator, the standard is being amended. The Administrator has declined to grant reqested relief from other requirements of the standard.

1. *Deletion of grade DOT 4 fluid.* Wagner Electric petitioned for the deletion of grade DOT 4 fluid, and the adoption of a single minimum standard with the viscosity requirements of grade DOT 4 and the boiling point characteristics of grade DOT 3.

As the Administration noted in the June 24 amendment to Standard No. 116, "there is a need for two grades of brake fluid until an all-weather fluid is developed with viscosity and boiling point characteristics suitable for use in all braking systems." Temperatures of fluids in use in Western mountain driving have reached 295°F., and the Administration deems it essential to retain the DOT 4 fluid, with its minimum wet equilibrium reflux boiling point (ERBP) of 311°F. Accordingly, Wagner's petition is denied.

2. *Deletion or modification of wet ERBP requirements.* Wagner, Union Carbide, and Hollingshead petitioned for the deletion of the wet ERBP requirements on the grounds that the test procedure is not sufficiently reproducible, and that vapor lock temperature is a more appropriate factor to use for determination of operational characteristics of a brake fluid.

The wet ERBP test is based primarily upon the SAE test for determination of the as received boiling point of brake fluid, a test that has been used by industry for years. The major problems in determining water content have been resolved. While the wet ERBP test procedure does not measure actual vapor lock temperature, which is often substantially below that of the wet boiling point, it provides a basis for measuring the in-service capacity of the fluid to resist vapor lock. The petitions are denied.

3. *Petroleum-based and silicone-based fluids.* Standard No. 116 as in effect until March 1, 1972, specifically excludes petroleum-based fluids from its applicability. The amendment of June 24, however, applies to "all brake fluid for use in hydraulic brake systems of motor vehicles," and effectively prohibits the manufacture of petroleum-based and silicone-based fluids whose performance characteristics differ from conventional brake fluids. Although we have asked for comments on appropriate performance requirements for non-hygroscopic fluids (Docket No. 71–13, Notice 1, 36 F.R. 12032), to be incorporated into a standard with a proposed effective date of January 1, 1973, there will be, at a minimum, a 10-month period during which manufacture of these fluids is effectivey prohibited. General Motors and Citreon have asked us to reconsider this point, the latter stating that all its vehicles

use a petroleum-based fluid, and that its sales in the U.S. will be effectively curtained during the hiatus between the two standards.

In the absence of a demonstrable safety problem concerning the use of petroleum-based and silicone-based fluids, the petitions are deemed to have merit and Standard No. 116 is being amended to exclude these fluids from its ambit. We urge manufacturers, however, to take precautions to assure that adverse cross-contamination with hygroscopic fluids does not occur in the absence of appropriate regulations intended to eliminate this hazard.

4. *Labeling requirements.* Automotive Parts and Accessories, General Motors, Hollingshead, Union Carbide, and Wagner Electric petitioned for reconsideration of various portions of the labeling requirements. Gold Eagle also apprised us of problems with labeling requirements.

The petitioners have brought to our attention that packagers may use more than one manufacturer as a source for brake fluid packaged under a single brand name, and that under the present regulation requiring manufacturer identification on the can, packagers will either have to stock dupicate cans or purchase from one source. We initially considered manufacturer identification to be necessary in the event of brake fluid defect notification campaigns. However, it has been determined that the serial number identifying the packaged lot and date of packaging will be sufficient for the packager to identify the manufacturer of any defective fluid, and paragraph S5.2.2.2(b) is being amended to delete manufacturer identification. In response to requests for alternate location of the serial number, S5.2.2.2(d) is being amended to allow the number to be placed below the information by S5.2.2.2(c). An alternate location has also been specified for the information required by S5.2.2.2(b) if it is in code form.

Two petitioners voiced the fear that the safety warning of paragraph S5.2.2.2(g)(1), to follow the vehicle manufacturer's recommendations in adding brake fluid, might result in the promotion by automobile dealers of specified brand names, possibly creating an unfair trade practice. The agency views this possibility as unrelated to motor vehicle safety since presumably all brake fluid will conform to Standard No. 116. In any event, a change of wording cannot eliminate this possibility, and the petitions are denied.

Petitions were also received requesting that the safety warnings against refilling containers (S5.2.2.2(g)(4)) not apply to storage containers with a capacity in excess of 5 gallons, since containers (30 and 50 gallon sizes, tank cars, etc.) differ from retail sale size cans and are reused for shipping purposes after cleaning. These petitions are granted and S5.2.2.2(g)(4) is being amended accordingly.

5. *Applicability to motor vehicles.* Union Carbide asked whether brake fluid in a vehicle must meet the requirements of Standard No. 116 when the vehicle is sold, pointing out that in extreme cases as long as a year may pass between its manufacture and sale. The NHTSA recognizes that original dry boiling points and viscosity of brake fluid may degrade due to the permeability of the brake system when a vehicle is exposed to the atmosphere over a period of time prior to its first sale for purposes other than resale, and that it is impracticable to require that brake fluid meet Standard No. 116 at time of sale when the "container" is a motor vehicle. Therefore, the standard is being amended so that the main portion applies only to brake fluid, with an added requirement applicable to motor vehicles, that they be equipped either with brake fluid manufactured and packaged in conformity with Standard No. 116, or with petroleum-based or silicone-based brake fluid (new paragraph S5.3).

6. *Resistance to oxidation: preparation.* An amendment to paragraph S6.11.4(b) specifies that the oxidation resistance test is to be conducted not later than 24 hours after the test mixture has been removed from the oven.

7. *Effect on SBR cups: procedure and calculation.* The SAE has also proposed a reduction of the time that the cups and fluid are exposed to oven heat at 70°C. The NHTSA is amending S6.12.4 to reduce exposure time to 70±2 hours, as it has been found that virtually all rubber swell occurs at this temperature during the first 48 hours.

The SAE has also concluded that cups should be retested and remeasured when the base diameters of the tested cups differ by more than

0.10 mm. This agency has determined that averaging four values as the change in base diameter, when a spread greater than 0.10 mm occurs, will result in a more precise determination of whether the requirements of paragraph S5.1.12(a) have been met, and is amending paragraph S6.12.5(a) appropriately.

8. *Typographical errors.* An erroneous standard barometric pressure figure of 750 mm appeared in the subscript of Table III and is being corrected to 760 mm. SAE Standard J1703a, referred to in S7.6, is corrected to read "J1703b."

9. *Interpretations.* Several petitions evidenced confusion over whether sale of fluids manufactured prior to March 1, 1972, will be allowed after that date. Sale of such fluids is permissible on and after March 1, 1972, until supplies are exhausted, with the legal requirement that they conform at time of sale to Standard No. 116 as in effect prior to March 1, 1972.

The agency was also asked whether name of city and zip code is acceptable as the complete mailing address of the distributor, required by paragraph S5.2.2.2(c). A mailing address is considered complete only if it is sufficient for the delivery of mail by the U.S. Postal Service, and containers must be marked accordingly.

Several petitioners asked for a delay to July 1, 1972, of various portions of the labeling requirements of paragraph S5.2.2.2 because of the logistics involved in modifying, in one instance, as many as ninety different labels. A delay in the effective date has not been found to be in the public interest, and the petitions on this point are denied. Gummed labels meeting the requirements of S5.2.2.2, however, may be affixed to these cans until new cans are available.

Finally, several petitioners requested clarification of the container sealing terminology in paragraph S5.2.1. The "inner seal" is the cap liner. Examples of "tamper-proof features" are devices such as a metal insert in the neck of the container, a plastic over-wrap, or a twist-off aluminum cap with a breakaway portion.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 116 in 49 CFR 571.21 is revised. . . .

Effective date: March 1, 1972.

Issued on November 8, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 21594
November 11, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 70–23; Notice 5)

The purpose of this notice is to amend 49 CFR § 571.116, Motor Vehicle Safety Standard No. 116, *Hydraulic Brake Fluids*, to permit certain required information to be placed on any permanent part of brake fluid containers.

Paragraphs S5.2.2.2(b) and S5.2.2.2(d) specify respectively that the name of the packager of the brake fluid, if in code form, and a serial number identifying the packaged lot and date of packaging shall be placed either beneath the distributor's name and mailing address, or on the bottom of the container. Gold Eagle Products Co. has asked if it is permissible to place the information required by S5.2.2.2(b) on the top of square gallon brake fluid containers. Such location is not presently allowed. The Administration, however, has concluded that manufacturers should not be restricted in their choice of location and that if it is more convenient for them to place the required information on the side or top of a container they should be allowed to do so, provided that the information is on a permanent part of the container. Accordingly, the NHTSA is amending the requirements to allow all required certification, marking and labeling information to be placed in any location except on a removable part such as a lid.

In consideration of the foregoing, paragraph S5.2.2.2 of 49 CFR § 571.116, Motor Vehicle Safety Standard No. 116, is revised in part . . . .

Effective date: August 29, 1972. Because the amendment relaxes an existing requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than 180 days after issuance is in public interest.

This notice is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Traffic Safety Act of 1966 (15 USC 1392, 1401, and 1407) and the delegation of authority at 49 CFR 1.51.

Issued on August 22, 1972.

Douglas W. Toms
Administrator

37 F.R. 17474
August 29, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 71-13; Notice 3)

This notice amends Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, 49 CFR § 571.116, to establish container labeling requirements for those fluids that are currently unregulated by the standard. The requirements are effective July 1, 1973.

The amendment is based upon a notice published March 22, 1972, (37 F.R. 5825). The NHTSA proposed labeling requirements for "central hydraulic system oil" and "silicone-based brake fluid", similar to requirements already in existence for conventional hydraulic brake fluids. The packager would be required to place his name on the container. His name could appear in code form. The packager would also be required to provide the complete name and mailing address of the distributor, a serial number identifying the packaged lot and date of packaging of the fluid, description of the contents, and certain safety warnings.

The comments received generally supported the proposal, and Standard No. 116 is being amended accordingly. The term "central hydraulic system oil" has not been adopted as some central hydraulic systems are designed for use of DOT brake fluids. Instead, the term "hydraulic system mineral oil" is adopted. It is defined as "a mineral-oil-based fluid designed primarily for use in motor vehicle brake systems in which none of the components contacting the fluid are SBR, EPDM, Neoprene, or natural rubber". Paragraphs S3, S5, S5.1, S5.2.2.1, and S5.2.2.2 are being amended in a manner that more clearly evidences the NHTSA's intent that Standard No. 116 applies to all fluid used as brake fluids, but that silicone-based brake fluids and hydraulic system mineral oil are currently excepted from performance, container, and labeling requirements applicable to DOT fluids. A new S5.2.2.3 specifies the labeling requirements for packagers of silicone-based brake fluids and hydraulic system mineral oil, and these generally parallel those required of packagers of DOT fluids. Packagers of hydraulic system mineral oil must furnish the additional warning that the fluid is not compatible with the rubber components of brake systems designed for use with DOT brake fluids.

The amendment also differs from the proposal in reflecting the revision of Standard No. 116 of August 29, 1972 (37 F.R. 17474) that allows information to be placed on a container "in any location except on a removable part such as a lid." Minor changes have been made in the text of the warning on fluid storage so that it is identical with the warning required for DOT fluids.

In consideration of the foregoing, 49 CFR § 571.116, Motor Vehicle Safety Standard No. 116, is amended. . . .

Effective date: July 1, 1973. Because these amendments relate to labeling requirements that do not entail product redesign, an effective date less than 180 days after the issue date is found to be in the public interest.

(Secs. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on: January 4, 1973.

Douglas W. Toms
Administrator

38 F.R. 2981
January 31, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 71–13; Notice 4)

This notice responds to a petition for reconsideration of brake fluid container labeling requirements by amending 49 CFR § 571.116 in minor respects.

Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, was amended on January 31, 1973, (33 F.R. 2981) to establish container labeling requirements for those fluids that are currently unregulated by the standard. Thereafter, a petition for reconsideration of the amendment was filed by General Motors Corporation pursuant to 49 CFR § 553.35. In response to the petition minor amendments are made to the standard.

General Motors believes that the NHTSA has not clearly indicated which mineral oil used in vehicle hydraulic systems must meet Standard No. 116. Hydraulic system mineral oil has been defined in part as a fluid "designed primarily for use in motor vehicle brake systems . . ." GM asserts that it is not clear whether a fluid "for use in a central hydraulic system composed of the power brake boost and the power steering systems must be considered *primarily* as a brake system application or *primarily* as a power steering system application." GM believes that since the power brake system is an auxiliary system whose fluids operate in a different environment than those in the primary system the standard should not include hydraulic boost system mineral oils.

The NHTSA intends the definition of hydraulic system mineral oil to include fluids used in any type of brake system regardless of the configuration. This definition must include fluids used in any hydraulic brake boost unit whose design is such that when a component fails, the boost unit fluid enters the master cylinder reservoir, hence contaminating the entire brake system. Such fluid must meet the applicable requirements of Standard No. 116. Fluids for use in systems where a failure will not introduce them into the master cylinder reservoir are not covered by Standard No. 116. The word "primarily" is being deleted from the definition of hydraulic system mineral oil to remove any doubt on this point.

GM points out that the warning a mineral oil manufacturer is currently required to provide refers to the oil as "brake fluid," in the container warning statements specified by the standard. Since mineral oil is not compatible with conventional or silicone-based brake fluid, GM believes it essential that it not be referred to as "brake fluid". The NHTSA concurs and is granting GM's petition by amending the labeling requirements concerned.

In consideration of the foregoing, 49 CFR § 571.116 Motor Vehicle Safety Standard No. 116 is amended. . . .

Effective Date: July 1, 1973. Because these amendments relate to labeling requirements that do not entail product redesign, an effective date less than 180 days after the issue date is found to be in the public interest.

(Sec. 103, 112, 119, Pub. L. 89–563, 80 Stat 718, 15 USC 1392, 1401, 1407; Delegation of Authority at 38 F.R. 12147).

Issued on: May 11, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 12922
May 17, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 71–13; Notice 6)

This notice amends 49 CFR 571.116, Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, to specify performance requirements for a low-water-tolerance (DOT 5) grade brake fluid, effective October 1, 1974, and to require a color coding system for all brake fluids and hydraulic system mineral oils, effective May 1, 1975, to safeguard against intermixing of incompatible fluids.

A notice of proposed rulemaking on this subject was published on November 21, 1973 (38 F.R. 32142), and an opportunity afforded for comment. The notice proposed performance requirements for brake fluids of low water tolerance, which would include but not be limited to silicone-based brake fluids. The notice also proposed a minor revision in the test procedures for determining cloudiness and lack of clarity in all brake fluids. Finally, the NHTSA proposed color coding for brake fluids and their containers as an appropriate method to prevent any brake system contamination. As the amendments adopted are substantially similar to those proposed, interested persons may refer to the notice which contains a full discussion of the proposals and the NHTSA's rationale for them.

A substantial number of comments submitted in response objected to either the idea of requiring a color coding system or the actual colors proposed for the different grades of fluid. The NHTSA considers that a properly implemented color coding system of fluids, containers, and reservoirs is an appropriate method of preventing brake system contamination. However, it realizes that sufficient time must be allotted to effect an orderly changeover and, therefore, these requirements have a delayed effective date. Several commenters requested modifications to specific color coding requirements. Citroen asked that the color green be permitted as an optional alternative to red for identifying mineral oils, based on its established use of this color in central hydraulic systems since 1965. This request has been denied in the interest of uniformity to minimize the possibility of inadvertent mixing of incompatible fluids. Several manufacturers of conventional glycol-type fluids stated that corrosion inhibitors and antioxidants often impart a reddish brown or straw color to the completed fluid prohibiting compliance with the proposed color ranges. In view of this information, the color range for DOT 3 and DOT 4 fluids has been broadened to allow variations from clear to amber, except for the container border which must be yellow. Further, it has been determined that visual inspection for color compliance is adequate, and the proposed wavelength bands have been deleted.

The other main issue raised was the use of the term "low water tolerance" when referring to silicone based brake fluids. Many commenters felt that the phrase "water intolerant" would more accurately describe the silicone fluids in light of the fact that the water tolerance test for DOT 5 fluids does not demand the absorption or retention of a specified percentage of water. DOT 5 grade fluid, however, is not limited to silicone based brake fluids. The term "low water tolerance" is found to be the most satisfactory description for a range of fluids potentially meeting the DOT 5 requirements and which may vary in water tolerance from 0.01% to 3.0%.

Several commenters pointed out that the chemical stability test of S6.5.4 is not applicable to DOT 5 fluids. The NHTSA concurs, and finds that the elimination of a chemical stability requirement for DOT 5 fluids will not significantly compromise safety. The standard has been amended accordingly.

The U.S. Army Chemical and Coating Laboratory and Bendix Corporation both submitted comments which requested that the low temperature viscosity requirement be established at a lower temperature, for instance −67° F., or that the maximum viscosity at −40° F. be set at 600 cSt. Both comments were constructive, one relating the operational characteristics of silicone fluids at temperatures of −67° F. and below and the other relating the necessary operational properties for the proper functioning of antilock systems at low temperatures. They are outside the scope of the proposal, however, and the NHTSA will consider these matters in future rulemaking.

In consideration of the foregoing, 49 CFR 571.116, Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, is amended. . . .

Effective date: October 1, 1974, with certain requirements effective May 1, 1975, as noted therein. Brake fluid of the type regulated by this standard is presently prohibited by the regulations of several States, and evidently is not being produced and sold for commercial purposes. The effect of this amendment, therefore, is to permit what was previously prohibited, and an effective date earlier than 180 days from the date of issuance is found for good cause shown to be in the public interest.

(Secs. 103, 112, 119, Pub. L. 89–563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1427; delegation of authority at 49 CFR 1.51.)

Issued on August 16, 1974.

James B. Gregory
Administrator

39 F.R. 30353
August 22, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 71–13; Notice 8)

This notice partially responds to petitions for reconsideration of amendments to 49 CFR 571.116 Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, that were published in the *Federal Register* on August 22, 1974 (39 FR 30353, as corrected at 32759). The standard is further amended to delete the requirements that were to have become effective May 1, 1975 for brake fluid color and for a color border around safety warnings on brake fluid container labels.

Standard No. 116 requires effective May 1, 1975, that DOT 3 and DOT 4 fluids be clear to amber in color, DOT 5 be blue, and hydraulic system mineral oil be red. For Motor Company petitioned for a reconsideration of the color requirements, asking that DOT 5 be clear or silver. Officine Alfieri Maserati, S.A. Automobiles Citroen, and U.S. Technical Research Corporation have asked that the color of hydraulic system mineral oil be changed from red to green. Other petitioners requested a delay in the effective date for color coding. Obviously a change in the color of the fluid would require a corresponding change in the color of the borders on container labels.

Consideration of these and other arguments by petitioners have delayed a formal response to the amendments of August 22, 1974. If the NHTSA determines that a petition for change of fluid color has merit, it will propose the change, in order to have the benefit of public comment, rather than amending the standard without notice. In the meantime, to alleviate the problems of manufacturers faced with the immediate need to order container labels, the NHTSA is amending the standard to delete the color requirements for fluid and container labeling. The deletion is only intended to be a temporary one, until the response to the petitions for reconsideration of the amendments of August 22, 1974 is published. A new effective date creating a leadtime of not less than 180 days will then be proposed.

In consideration of the foregoing 49 CFR 571.116 Motor Vehicle Safety Standard No. 116 is amended. . . .

Effective date: March 25, 1975. Because the amendment relieves a restriction and creates no additional burden, it is found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest.

(Sec. 103, 112, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1427); delegation of authority at 49 CFR 1.51).

Issued on March 19, 1975.

James B. Gregory
Administrator

40 F.R. 13219
March 25, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 71–13; Notice 9)

This notice further responds to petitions for reconsideration of amendments to 49 CFR 571.116, Motor Vehicle Safety Standard No. 116, *Motor Vehicle Brake Fluids*, that were published in the *Federal Register* on August 22, 1974 (39 FR 30353, as corrected at 39 FR 32739). A partial response deleting color coding requirements was published on March 25, 1975 (40 FR 13219). This notice amends the standard in minor respects.

Petitions were received from General Motors Corporation, Ford Motor Company, Wagner Electric Corporation, Officine Alfieri Maserati, S.A. Automobiles Citroen, and U.S. Technical Research Corporation. Late-filed petitions were received from EIS Automotive and the Bell Company and in accordance with 49 CFR 553.31 they have been treated as petitions for rulemaking. The issues raised by the petitions and their disposition are set forth below.

Revocation. Ford petitioned to revoke the amendments adding DOT 5 brake fluids, because "it has reason to believe that they are incompatible with at least some of the brake systems currently used on Ford vehicles." Specifically Ford argues that the fluids "may cause hazardous deterioration of brake systems or their components." In support Ford referenced a recent letter from Bendix to the Non-Conventional Brake Fluid Task Group of the Society of Automotive Engineers, describing a series of tests conducted with silicone brake fluid "in a hydrovac brake system typical of the system used in some Ford products." NHTSA has learned that Bendix subsequently informed SAE that the tests were erroneously reported and recommended further testing. This agency finds that good cause has not been shown for the revocation, and Ford's petition is denied.

Ford also commented that DOT 5 fluid would not have sufficient electrical conductivity to permit the operation of its intended brake fluid level sensor to meet a requirement of Motor Vehicle Safety Standard No. 105–75 *Hydraulic Brake Systems*. The NHTSA regards this as a design problem, peculiar to Ford, that is outweighed by the safety advantages of allowing motor vehicle manufacturers and motorists the option of choosing a low-water-tolerant brake fluid. Ford's petition is denied.

Fluid color. A discussion of issues raised by the petitions for reconsideration of fluid color and labeling will be contained in a notice of proposed rulemaking on this subject to be published shortly. (Docket No. 71–13; Notice 10).

Minor amendments. An editorial error in the amendment to paragraph S5.1.5.2 published on September 11, 1974 (39 FR 32739) is corrected. Paragraph S5.2.2.3 is amended to remove superfluous references to "brake fluid." Paragraph S6.7.3(a) is amended to include a reference to isopropanol. Finally, to agree with a change made in S6.12.4 (39 FR 21599) S6.12.1 is corrected by changing a reference to "120 hours" to "70 hours."

In consideration of the foregoing 49 CFR 571.116 Motor Vehicle Safety Standard No. 116 is amended. . . .

Effective date: May 16, 1975. Because the amendments correct errors and create no additional burden on any person it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1407); delegation of authority at 49 CFR 1.51).

Issued on May 12, 1975.

James B. Gregory
Administrator

40 F.R. 21474
May 16, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids

(Docket No. 71–13; Notice 12)

This notice amends Standard No. 116, *Motor Vehicle Brake Fluids*, to specify color coding requirements for hydraulic brake system fluids, to alter the warnings required on labels, to include a definition for "brake fluid," and to revise the definition of "hydraulic system mineral oil."

These amendments are based on a proposal to amend Standard No. 116 (49 CFR 571.116) issued by the National Highway Traffic Safety Administration (NHTSA) on December 5, 1975 (40 FR 56928). Interested persons were afforded an opportunity to submit comments on the proposal by February 5, 1976, and due consideration has been given to the 15 comments received. The National Motor Vehicle Safety Advisory Council did not take a position on the proposed amendments.

As proposed, paragraphs S1 and S2 of Standard No. 116 are amended to substitute the word "fluid" for the term "brake fluid," since the standard now includes requirements for hydraulic system mineral oils which are not normally called "brake fluids." A definition of the term "brake fluid" is added to the standard in order to clarify the distinction between it and hydraulic system mineral oil.

With regard to the proposed definition of hydraulic system mineral oil, Citroen requested that polychloroprene rubber (CR) be deleted from the list of components designated as incompatible with the mineral oil. The NHTSA has determined that Citroen's comments have merit, since the type of CR used in brake hoses is compatible with hydraulic system mineral oils, unlike the SBR, EPR, and NR materials also listed in the proposed definition. This final rule reflects revision of the definition accordingly.

In addition to changes in the labeling requirements, the notice proposed color coding requirements for both fluids and their containers and closures. After reviewing the comments submitted in response to the proposed amendments, the NHTSA has decided not to adopt the proposed changes in labeling (with one exception) or the proposed color coding of containers and their closures. The NHTSA has concluded that color coding of the fluids, combined with the existing warnings on container labels, is a sufficient safeguard against failures in hydraulic braking systems that may result from the use of improper or contaminated fluids.

The proposed color coding of fluids was generally supported by the commenters, although there were requests for colors different than those specified in the proposal. Burma-Castrol requested that the NHTSA defer color coding of fluids until the International Standards Organization (ISO) establishes standard colors for all motor vehicle fluids. This request is denied since the ISO is not actively developing a color code, and there is no indication that it will issue such a code at any time in the near future. The NHTSA can act immediately to reduce the potential safety hazards created by the use of improper fluids in hydraulic braking systems.

Alfred Teves GMBH requested that the color requirement for DOT 3 and DOT 4 brake fluids be blue instead of the proposed "colorless to amber," in order to distinguish these fluids from motor oil and antifreeze. This request is denied since there are many windshield cleaning solutions and some antifreeze fluids that are blue, and because most domestic brake fluids are currently "colorless to amber."

Volkswagen also requested that DOT 3 and DOT 4 brake fluids be blue in order to assure visibility of the fluids in translucent master cylinder reservoirs. The NHTSA does not consider visibility in master cylinders to be a problem since clear or amber fluids would be visible initially in most cases, or would soon become so, because brake fluids generally darken rapidly with use. The major purpose of the color coding requirements is to permit easy identification of fluids before they are placed in the vehicle, in order to prevent the mixing of an incompatible fluid in a braking system. Volkswagen pointed out that if amber or yellow fluids are mixed with the blue fluids that are currently in many master cylinder reservoirs, the resulting green colored fluid might be mistaken for a hydraulic system mineral oil (by this amendment, hydraulic system mineral oils are required to be green). The NHTSA does not consider this concern justification for a change in the proposed color because, as stated earlier, most brake fluids tend to become darker after they are in use for a short period.

Volkswagen suggested that hydraulic system mineral oils be required to be red in color instead of green to avoid any confusion with mixtures of existing brake fluids that would be green. The NHTSA rejects this suggestion in order to avoid confusion with the synthetic red fluids that must be used in some older brake systems. The addition of the wrong fluid to such vehicles could result in substantial damage to the brake system and potential brake failure.

The U.S. Army Mobility Equipment Research and Development Center requested that hydraulic system mineral oils be required to be colored red, consistent with the Army color code. The Center's comment cited examples of brake failure caused by the inadvertent mixing of incompatible fluids in hydromechanical systems. The NHTSA has determined, however, that inconsistency between the Army color code and the proposed color coding requirements for oils sold commercially should not create a safety problem. Only mineral oils procured specifically for use by the military would be colored red, because § 571.7(c) of NHTSA regulations (49 CFR 571.7(c)) provide that no standard applies to a vehicle or item of equipment manufactured for, and sold directly to, the Armed Forces of the United States in conformity with contractual specifications. If a situation arose in which it was necessary to buy commercial oil for a military vehicle, the oil would be purchased according to label information.

The Brake System Parts Manufacturers Council (BSPMC) reiterated its previous comments to Docket No. 71–13, Notice 5, stating that requirements for color coding of fluids and containers would not enhance safety but would only increase cost. They commented that the matching of a fluid in a master cylinder reservoir by its color would be impossible after a few months since DOT 3 and DOT 4 fluids tend to darken rapidly and thereafter might not be distinguishable from incompatible green hydraulic system mineral oils. They further commented that because master cylinder reservoirs are not required to be color coded with the appropriate fluid, the inadvertent mixing of incompatible fluids would still continue to occur.

The NHTSA agrees that the matching of color coded fluids is difficult under certain conditions. However, the main purpose of the fluid color coding requirements is to enable users to distinguish among various unused brake fluids, rather than to match fluid in a master cylinder with additional fluid. It is particularly important to be able to distinguish fluids when they are in unmarked drums or pressure dispensing containers in garages.

Volkswagen requested that the NHTSA regulate the marketing of DOT 5 brake fluids to prevent their use in vehicles unsuited to DOT 5. Volkswagen takes issue with advertisements stating that DOT 5 fluids are suitable for all vehicles and that they can be mixed with all other types of brake fluids. It contended that DOT 5 fluids cause severe corrosion when added to brake systems containing DOT 3 fluids, and submitted a report of laboratory tests to substantiate this claim. Volkswagen recommended that DOT 5 fluids be excluded from regulation by Standard No. 116.

The request by Volkswagen is repetitious of a petition for reconsideration submitted by Ford Motor Company that was denied by a notice published May 16, 1975 (40 FR 21474). Ford petitioned to revoke the amendments that added DOT 5 brake fluids to the standard, because the fluids "may cause hazardous deterioration of brake systems or their components." The NHTSA rejected Ford's petition on the basis that the information submitted did not substantiate the claim that DOT 5 fluids are deleterious to some brake systems. Likewise, the NHTSA does not consider the test reports submitted by Volkswagen adequate to simulate actual field use, and field testing in the United States and Panama has demonstrated that mixtures of DOT 5 and DOT 3 fluids do not accelerate corrosion.

It should be understood that the NHTSA considers the question of the compatibility of DOT 5 fluids with brake systems and other brake fluids to be a separate issue from the question whether DOT 5 fluids should be regulated by Standard No. 116. The fact that DOT 5 fluids might cause corrosion in certain systems does not mean that there should not be specified performance requirements for DOT 5 fluids in Standard 116. By its terms Standard No. 116 applies "to all fluid for use in hydraulic brake systems of motor vehicles."

Concerning Volkswagen's alternative request that the NHTSA regulate the marketing and use of DOT fluids, we assume that Volkswagen intended this to be accomplished by the use of additional warnings on the labels of DOT 5 brake fluid containers. Any such labeling changes will have to be dealt with in future rulemaking. Interested persons should submit additional data concerning the compatibility of DOT 5 with various brake systems and other brake fluids, along with any recommended label changes.

The notice proposing these amendments also specified requirements for the color coding of brake fluid containers. Bell Chemical Company, Brake System Parts Manufacturers Council, Gold Eagle and Wagner Corporation opposed the proposed color coded border around the printed warnings on brake fluid containers, on the basis that the color of the border would have no significance to the typical consumer. They commented that the proposed borders would cost approximately one million dollars for printing and that no tangible benefit would be realized. After considering these comments, the NHTSA has decided that the color coded borders should not be required on brake fluid containers. Likewise, the color coded cap requirement is not included in paragraph S5.2.2.4 as was proposed, although the proposed labeling requirement of S5.2.2.5 is made final as S5.2.2.4. It specifies that the labeling requirements of the standard shall be placed on the protective outer container or carton of brake fluids whose inner container is not normally visible during use. Since the color-coded-border requirement is not adopted, the proposed paragraph S5.2.2.6 regarding color tolerance requirements is unnecessary and, therefore, is not included in the amendments.

Eight commenters opposed the proposed color coding requirements for container caps and closure devices. The commenters pointed out that consumers would not be cognizant of the significance of the colored caps, and that procurement of colored caps would result in high costs and require long lead times. It was also noted that the wrong color of cap could easily be inadvertently applied by packagers or switched by users of the brake fluids. Further, they stated that since service stations and shops often mount dispenser pumps on one gallon brake fluid cans in place of their original caps, the purpose of color coded caps would be thwarted in many instances. The NHTSA has concluded that these arguments have merit. The proposed requirements for color coded caps and closures are not included in the amendments.

The proposed labeling changes included specification of the minimum wet boiling point in degrees Celsius as well as Fahrenheit, container capacity in liters as well as gallons, and colored border width in millimeters as well as inches. Classic Chemical supported these proposed labeling changes. Wagner Electric and Bell Chemical opposed them on the basis that metric equivalents do not serve a safety need and should be left to the jurisdiction of the Federal agencies responsible for the "metrication" program.

The agency's authority extends to labeling with safety information, and all available methods to increase the comprehensibility of labeling, including metric equivalents, is justified. Nonetheless, the NHTSA has concluded that the cost of the proposed metric labeling does not justify a change at this time. The proposed changes in S5.2.1(c), S5.2.2.2(f) and S5.2.2.2(g)(4) are not adopted.

Classic Chemical objected to the proposed change in the last sentence of paragraph S5.2.1 regarding requirements for container sealing.

The rewording was proposed for the purpose of clarifying the requirement that the container closure be tamper-proof to the extent that it would be obvious to a user that the closure had been previously opened. Classic Chemical commented that the present wording which refers to inclusion of a "tamper proof feature" is preferable to the proposed wording. After reconsideration, the NHTSA has decided that the proposed rewording could result in confusion rather than clarification. Therefore, paragraph S5.2.1 is not amended as was proposed.

Dow Corning Corporation, a manufacturer of DOT 5, a low-water-tolerance silicone brake fluid, earlier suggested that the admonition in S5.2.2.2(g)(3) to keep containers "tightly closed to prevent absorption of moisture" is unnecessary and redundant when applied to water intolerant brake fluids such as DOT 5 fluids. Based on this suggestion, the notice proposing these amendments specified the amendment of S5.2.2.2(g)(3) to read, ". . . to prevent entry of water and other contaminants." Wagner Electric commented that the S5.2.2.2(g)(3) warning label on DOT 3 and DOT 4 containers should not be required to be changed simply because the label does not apply, as worded, to DOT 5 brake fluids. They noted that consumer cost could be greatly reduced if only the labels on DOT 5 fluids are changed. The NHTSA agrees with this suggestion. Paragraph S5.2.2.2(g)(3) is therefore modified to add the following parenthetical: "(The last five words of the second sentence may be omitted from the labeling on DOT 5 containers.)"

Bowes Seal Fast commented that the third warning listed in S5.2.2.2(g) ("Store Brake Fluid Only In Its Original Container . . .") is contrary to the general garage practice of using dispensing containers that are continuously refilled from bulk containers. Bell suggested that warning number (3) be eliminated on the basis that warning number (2) is adequate. The NHTSA considers the dispensing containers to be devices for use rather than for storage, so warning number (3) is not contrary to normal garage practices. The NHTSA disagrees with Bell since warning number (2) concerns contamination of fluids in master cylinders, while warning number (3) pertains to the storage of fluids.

The notice proposing these amendments specified a new consumer warning against accepting containers whose "tamper proof" seals have been broken. Wagner opposed the proposed warning. They noted that metal screw caps on fluid containers are often very tightly fastened, and that consumers could not remove them without pliers to inspect the inner "tamper proof" seal. The tendency would be, according to Wagner, to not inspect the inner seal at the place of purchase. The NHTSA has considered these comments and further evaluated the possible problems of the sale of brake fluid or hydraulic system mineral oil containers refilled with other than approved fluid. It has been determined that the potential safety problem does not warrant the expense of adding another warning of this type to either the container or its outer closure. The proposed new warning, S5.2.2.2(g)(5), is not adopted.

The notice preceding these amendments proposed the amendment of paragraph S6.7.3(a) to specify the phrase "suitable solvent" rather than the solvents presently listed, to be used to inhibit frosting of the exterior surfaces of specimen containers in the test for fluidity and appearance at low temperature. After reconsideration, the NHTSA has decided that this proposed change might only create confusion and should, therefore, not be adopted. This does not mean that manufacturers are restricted to the use of ethanol, isopropanol, or acetone. The obligation of a manufacturer is to ensure that its certification of compliance is not false or misleading in a material respect, and that it has exercised due care in manufacturing to conform to the requirements of Standard No. 116 (15 U.S.C. § 1397 (b)(2)). A manufacturer is not required to follow specifically the test procedures for the standards, but only to ascertain, in the exercise of due care, that its product will conform to the standard's requirements when it is tested by the stated methods.

The NHTSA has determined that these amendments will have a negligible economic impact. It is estimated that the color coding requirements will have an annual cost of approximately $10,000. Because of residual inventories it should take several years before all brake fluids are color coded. After this phasing-in period it is estimated that the amendments will result in the reducing of aproximately 400 accidents per year, with an annual consumer cost savings of $512,000. The NHTSA has determined that the amendments will have a negligible effect on the environment.

It has been determined that an effective date later than the normal statutory limit of one year is justified for these amendments in order to give manufacturers and packagers sufficient time to exhaust existing supplies of brake system fluids destined for new motor vehicles.

In consideration of the foregoing, Standard No. 116 (49 CFR 571.116) is amended. . . .

Effective date: September 1, 1978.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on December 6, 1976.

John W. Snow
Administrator

41 F.R. 54942
December 16, 1976

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids
(Docket No. 85-02; Notice 2)

ACTION: Final Rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard (FMVSS) No. 116, *Motor Vehicle Brake Fluids,* and FMVSS No. 106, *Brake Hoses,* to revise the referee materials and test procedures referenced in portions of those standards. FMVSS No. 116 and FMVSS No. 106 currently reference the referee material (RM) identified as RM-1 fluid by the Society of Automotive Engineers (SAE). However, RM-1 fluid is now commercially unavailable, and is less representative of brake fluids used in vehicles on the road today. The SAE in its January 1980 revision of Standard J1703, "Motor Vehicle Brake Fluid," substituted a new referee material, RM-66-03, in place of RM-1 for use in the J1703 compatibility test. This final rule adopts this revision and references RM-66-03 for use in the compatibility test of Standard No. 106, and the compatibility and fluid chemical stability tests of Standard No. 116. This notice also references a new referee material, TEGME, in the humidification procedure of Standard No. 116, adjusts the water content level and test temperature referenced in the test procedures, and amends the number of sets of stroking test materials in the stroking test procedures. This notice also makes procedural modifications to Standard No. 116's humidification procedure adopted from the SAE, and corrects the description of test procedures used to evaluate brake fluid stroking properties.

EFFECTIVE DATE: Due to the commercial unavailability of RM-1 fluid, this rule is effective May 6, 1986. However, because the agency is concerned that manufacturers who might still be using RM-1 fluid to test their products should be able to use their existing supplies, use of RM-1 fluid may continue until November 3, 1986.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard (FMVSS) No. 116, *Motor Vehicle Brake Fluids,* and FMVSS No. 106, *Brake Hoses,* specify performance requirements for motor vehicle brake fluids and brake hoses. Included in the performance requirements of Standard No. 106 is a brake fluid compatibility test, and included in Standard No. 116 are compatibility, chemical stability, and humidification tests. Referee materials are used to test specimens of brake hose and brake fluid for compliance with the standards' requirements. These materials provide a basis of comparison between the results of the tests and the specifications of the standards. The procedures for the compatibility, chemical stability, and humidification tests currently reference the referee material brake fluid specified by the Society of Automotive Engineers (SAE) in the April 1968 version of SAE Standard J1703b. Standard J1703b, in turn, references a referee material (RM) identified as RM-1. (Standard No. 116's description of SAE Standard J1703b, "Motor Vehicle Brake Fluid," April 1968, is incorrect in that the correct reference should be to J1703b, July 1970. In 1970, the agency proposed to reference test procedures of J1703a, April 1968, in Standard No. 116. Subsequently, NHTSA changed reference from J1703a to J1703b. The effort to make this change inadvertently resulted in showing April 1968, the date of J1703a, as the date of J1703b. This notice corrects the error by referencing J1703b, July 1970.)

This rule amends FMVSS Nos. 116 and 106 to revise the referee materials and test procedures referenced in portions of those standards. The SAE, in its January 1980 and November 1983 revisions of Standard J1703, "Motor Vehicle Brake Fluid," substituted a new referee material, RM-66-03, in place of RM-1 for use in the J1703 compatibility test. This notice adopts this revision and references RM-66-03 for use in the compatibility test of Standard No. 106, and the compatibility and fluid chemical stability tests of Standard No. 116. This notice also references a new referee material, TEGME, in the humidification procedures of Standard No. 116, adjusts the water content level and test temperature referenced in the test procedures, and amends the number of sets of stroking test materials in the stroking test of Standard No. 116. This notice also adopts SAE revisions to FMVSS No. 116's humidification test which had been inadvertently omitted from the amendatory language of the proposed rule, and corrects the description of test procedures used to evaluate brake fluid stroking properties.

Testing Brake Hose/Fluid Characteristics

Brake fluid compatibility is an important factor in establishing brake hose life and strength characterisitcs. The compatibility test of FMVSS No. 106 measures hydraulic brake hose compatibility with brake fluid. The brake hose test specimen is filled with the SAE Compatibility Fluid for a required number of hours at specified temperatures, and is then subjected to constriction and burst strength tests. Currently, RM-1 fluid is referenced in the test procedures for the standard's brake fluid compatibility test.

Under the compatibility requirements of FMVSS No. 116, the compatibiltiy of a brake fluid with an RM fluid is determined. The compatibility fluid that is used in these tests as a referee material should be representative of the fluids found in a braking system in service. The tests measure the compatibility of fluids of different chemical bases by checking whether there are undesirable chemical interactions resulting from the mixture of fluids. Paragraph S6.10 sets out the procedures for evaluating the compatibility of a brake fluid with other liquids used in a hydraulic brake system (i.e., other brake fluids). This section currently references RM-1 fluid as the referee material used in that test procedure.

The humidification tests of FMVSS No. 116 measure the amount of water absorbed by a brake fluid as compared to a reference fluid. The presence of water in a brake system degrades braking performance and safety by lowering the boiling point of brake fluid, increasing the possibility of vapor lock and the corroding of system components, and the depositing of sediment in wheel cylinders that could cause a system malfunction.

Standard No. 116 establishes minimum wet equilibrium reflux boiling points (ERBP's) for different grades of brake fluid, and the test procedures of S6.2 determine the water content and wet ERBP of brake fluid specimens. The current test procedure specifies that sample fluids of RM-1 and the test specimen are to be humidified simultaneously under controlled conditions. The SAE RM-1 fluid is used as the reference fluid that establishes the "endpoint" for humidification. When the water content of the RM-1 fluid is measured to be 3.50 ± 0.05 percent by weight, the test fluid sample is removed from the humidification apparatus. After humidification, the water and ERBP of the sample are determined.

Section 7.2 of FMVSS No. 116 also refers to RM-1 fluid as a reference for measuring the water content of brake fluids.

RM-66-03 Fluid

A notice of proposed rulemaking (NPRM) on this rulemaking action was published on March 7, 1985 (50 FR 9294). The NPRM explained that FMVSS Nos. 106 and 116 currently reference SAE RM-1 Compatibility Fluid in their test procedures. In that notice, the agency announced its tentative finding that the inclusion of RM-1 fluid is no longer desirable for the following reasons.

The agency stated its belief that reference to RM-1 fluid should be changed because manufacture of the fluid has ceased. A new fluid, identified as RM-66-03 Compatibility Fluid, has replaced the RM-1 fluid in test procedures described in the January 1980 and November 1983 revisions of SAE Standard J1703. This new fluid is described by the SAE as a blend of four proprietary polyglycol brake fluids of fixed composition, in equal parts by volume. The four fluids selected comprise three factory-fill and one after-market fluid as follows: DOW HD50-4, DOW 455, Delco Supreme II, and Olin HDS-79.

While RM-1 fluid is not readily available, RM-66-03 fluid is available from the SAE in the blend and formulation developed by the SAE for J1703. The indiviual manufacturers of the four proprietary fluids have indicated to the SAE Brake

Fluids Subcommittee and Reference Materials Subcommittee that the proprietary formulation might be changed in the commercial market, but that the formulations developed for the RM-66-03 fluid would be guaranteed to be available for a minimum five-year period commencing May 1983, i.e., at least until May 1988.

The updated reference to RM-66-03 fluid by the SAE is a result of the termination of the manufacturing of the RM-1 fluid. Several of the ingredients contained in the RM-1 fluid are not available to fluid manufacturers since the materials are no longer used in today's fluids, or have become prohibitively costly to obtain. As a result, manufacturers are unwilling to produce more RM-1 fluid.

In addition, RM-1 fluid is not representative of fluids in service today. The agency stated its belief that revising the referee material used in the compatibility test is warranted since the purposes of that test would be better served by a referee material more representative of today's fluids. Inclusion of RM-1 fluid in FMVSS Nos. 116 and 106 is also undesirable because RM-1 fluid contains toxic materials which require elaborate protective procedures and special handling and manufacturing processes.

In consideration of the foregoing, NHTSA proposed an amendment to FMVSS Nos. 106 and 116 to substitute new referee materials for the compatibility and humidification tests. For Standard No. 106's compatibility requirement and test procedures (S5.3.9 and S6.7), and Standard No. 116's compatibility (6.10), fluid chemical stability (6.5), and water content (7.2) tests, the new referee material was proposed to be RM-66-03 fluid as described in the January 1980 version of SAE Standard J1703.

Seven commenters responded to the NPRM. Each commenter agreed with the proposal to reference RM-66-03 fluid in FMVSS Nos. 106 and 116. General Motors Corporation (GM) and Chrysler Corporation agreed with the agency's tentative conclusion that the new referee material would be more available and compatible with current brake fluids than RM-1 fluid. Other commenters believed that the change would be practical and reasonable.

NHTSA has considered the comments to the NPRM and has decided to amend FMVSS Nos. 106 and 116 to reference RM-66-03 compatibility fluid. One slight change has been made to the NPRM's proposal. The NPRM proposed to reference the RM-66-03 fluid as described in the January 1980 revision of SAE Standard J1703. This rule will reference RM-66-03 fluid as described in the November 1983 revision of J1703. The two SAE revisions of J1703 are identical in their descriptions of RM-66-03; the agency is making this change in order to keep FMVSS Nos. 106 and 116 current by referencing the more recent SAE standard.

Use of the RM-66-03 fluid in the test procedures of Standards Nos. 116 and 106 should have a beneficial impact on safety. Since the RM-1 compatibility fluid currently referenced in FMVSS Nos. 106 and 116 is not commercially available, ascertaining whether hoses and fluids comply with certain requirements related to compatibility and boiling points is difficult. Amending the standards to allow the use of RM-66-03 fluid in place of RM-1 provides a readily available compatibility fluid for the compliance tests which is more representative of fluids used in today's vehicles.

TEGME, Brake Fluid Grade

In humidification test procedures under FMVSS No. 116, the referee material fluid is used as a reference to determine when to terminate the humidification procedure. Currently, RM-1 fluid is used as this referee material. NHTSA proposed to amend Standard No. 116 to reference a new referee fluid, triethylene glycol monomethyl ether (TEGME), brake fluid grade, as the referee material noted in Standard No. 116's procedures for a brake fluid's wet equilibrium reflux boiling point (S6.2). TEGME has been referenced by the SAE in J1703, January 1980, and J1703, November 1983, as the referee material used in the humidification test procedure.

In addition to referencing the TEGME material, the agency also proposed to amend S6.2 of FMVSS No. 116 to adjust the final water content of the referee material fluid to 3.70% water (instead of the current requirement of 3.5%), change the test temperature to 50°C. (from 23°C.), and add a cooling period for the sealed jar sample. As explained in the NPRM, those changes (use of TEGME fluid, change in water pickup and test temperature, and the cool-down to room temperature) were proposed as part of the overall changes adopted from SAE J1703 procedures.

All but one of the commenters to the notice supported the changes to the TEGME fluid. Commenters believed that the changes would simplify the test procedures and make them more cost effective.

In its comment on the NPRM, Union Carbide questioned whether there are adequate data to show that the new humidification test procedure will produce comparable test results when applied to DOT-4 and DOT-5 brake fluids. That commenter suggested that NHTSA reconsider adopting the SAE J1703, January 1980 humidification test method or adopt it as an alternative to the current method that uses RM-1 fluid until complete comparative testing could be performed.

The agency does not agree with Union Carbide that the humidification test method of SAE J1703, January 1980 should not be adopted as the new Standard No. 116 test procedure. The TEGME fluid is capable of absorbing a measurable amount of water in a given time and is only used as a reference to determine when to terminate the humidification process. Under the humidification test procedure, samples of brake fluid and TEGME are humidified simultaneously until a measured quantity of fluid is picked up in the TEGME. When the water content of the TEGME fluid reaches 3.7 percent, the brake fluid test specimens are removed from the test apparatus and their water contents and ERBP's are measured. TEGME, the referee material used in the humidification procedure, thus serves only to establish the end point of a test procedure.

The 3.7 percent TEGME water pickup (at 50°C) corresponds to the 3.5 percent water pickup (at 23°C) of the referee fluid (RM-1) used previously to determine the end point of the humidification procedure. The agency has determined that DOT-3 fluid picks up the same amount of water when humidified under procedures which use TEGME as the referee material as it does when humidified under procedures using RM-1. Therefore, the agency believes that the water pickup of test fluids, including DOT-4 and DOT-5 fluids, would not be affected by the change to TEGME. Accordingly, NHTSA is amending FMVSS No. 116 to reference the TEGME referee material.

The NPRM proposed to reference the TEGME fluid as described in the January 1980 revision of Standard J1703. This rule will instead reference TEGME as described in the November 1983 revision of J1703. The two SAE revisions of J1703 are identical in their descriptions of TEGME; the agency is making this change in order to keep FMVSS No. 116 current by referencing the more recent SAE standard.

Humidification Test Procedures

All commenters supported the additional changes to the humidification procedure of S6.2 adopted from SAE Standard J1703. This rule adopts the proposed changes to S6.2 and adjusts the final water content of the referee material fluid to 3.70%, changes the test temperature to 50°C, and adds a cooling period for the sealed jar sample.

Other changes to the humidification procedure were suggested in the comments to the NPRM. GM and Union Carbide Corporation pointed out that while NHTSA proposed to adopt the humidification test procedures from SAE J1703, the procedural modifications proposed in the amendatory language differed slightly from the SAE standard. GM suggested changing FMVSS No. 116's humidification procedure to agree with that of SAE J1703, January 1980 in order to facilitate testing. The following changes were suggested: S6.2.1 should be revised to require 150 ml. samples of brake fluid and TEGME instead of the proposed 100 ml. samples; S6.2.3 should be revised to eliminate ammonium sulfate from the list of reagents and materials and to specify distilled water and TEGME; S6.2.4 should be revised to load the dessicators with 450 ml. of distilled water instead of the ammonium sulfate/distilled water slurry; and S6.2.5 should be revised to use 150 ml. samples of the brake fluid and TEGME instead of the proposed 100 ml. samples.

As evidenced by the GM and Union Carbide comments, it was clear that the agency intended to facilitate testing by adopting the overall changes to the humidification test from SAE J1703. Therefore, NHTSA agrees that those additional changes should be incorporated into this final rule. This rule amends S6.2.1, S6.2.3, S6.2.4 and S6.2.5 to correct the minor omissions noted above. Further, S6.2.2 is revised to clarify that distilled water would be substituted for the salt slurry in Figure 3 of FMVSS No. 116, *Humidification Apparatus,* when TEGME is used as the referee material.

Stroking Test

The stroking test in FMVSS No. 116 checks the lubricity effect of a brake fluid on rubber components. The NPRM explained that the SAE had determined, in its revision of J1703, January 1980, that three sets of test material are sufficient to analyze the adequacy of test results. The notice announced that, based on NHTSA's tentative agreement with that SAE conclusion and its belief that compliance testing costs would be reduced by that change without an adverse affect on safety, the agency was proposing to amend the requirements of S5.1.13 and S6.13 to require testing of only three sets of test material (consisting of wheel cylinders, drums, shoe assemblies, etc.) instead of four sets, and eight new brake cups instead of 10. Since NHTSA proposed to reduce the number of cups tested, a reduction in the number of cups checked for unsatisfactory operating condition was also proposed.

All comments supported the agency's proposal to revise the stroking test procedures. The commenters believed that the changes proposed in the NPRM would simplify the test procedures and make them more cost effective. NHTSA agrees, and has revised S5.1.13 and S6.13 as proposed in the NPRM.

In addition, this rule makes several changes to the stroking test procedures in FMVSS No. 116 which directly relate to the agency's adoption of the SAE stroking test revision. Currently, S6.13.2 describes the apparatus and equipment used for the stroking test and refers to figures in SAE Standard J1703b which depict stroking apparatuses. Figure 1 of J1703b depicts four sets of drum and shoe assemblies. Since NHTSA has reduced the number of sets of test materials to three, the agency believes that the description of the test apparatuses and arrangement of test materials should also be revised to reflect this change. The description of the apparatuses used in the stroking test is changed only to clarify that three sets of materials are used, instead of four.

The following related revisions to the stroking test procedure are necessary to facilitate the change to three sets of materials. Paragraph S6.13.4(c) describes the preparation and assembly of test apparatuses. When a shoe and drum type apparatus is used, S6.13.4(c) specifies a 23 mm. stroke length, based on output piston movement of four sets of wheel cylinders. Stroke length refers to the distance traveled by the master cylinder piston to displace a certain volume of fluid in the test system which, in turn, forces the wheel cylinder pistons to travel a specified distance. Since the stroking test is revised to require only three sets of materials, the stroke length of the master cylinder would no longer be 23 mm.

This rule deletes reference in S6.13.4(c) to exact piston displacement measurements and a 23 mm. stroke length. The agency has determined that it is not necessary to specify master cylinder and wheel cylinder piston travel since those values are determined by the characteristics of the system which are specified in the standard (i.e., dimensions of the master cylinder and wheel cylinders, and pressure). The stroking test apparatus is a closed hydraulic system; pressure of 1000 pounds per square inch (psi) is generated at the outlet port of the master cylinder, and all pistons have the same diameters of $1^1/_8$ inch. Given the above, displacement of the wheel cylinders is directly proportional to the displacement of the master cylinder, and in the given test apparatus the stroke length of the master cylinder is dependent on system pressure. Stroke length would therefore be adjusted by the characteristics of the system from the former value of 23 mm. to a value proportioned for three wheel cylinders.

Since the agency is eliminating exact wheel cylinder piston travel measurements and is specifying that only three sets of test materials are required in the stroking test, this rule also deletes reference in S6.13.4(c) to Figure 4 of SAE Standard J1703b. That figure illustrated the approximate pressure buildup versus the master cylinder piston movement, and was based on the use of four sets of materials. S6.13.4(c) would continue, however, to specify that the pressure buildup is relatively low during the first part of the stroke, in order to avoid damage of the master cylinder's primary cup by ensuring that the primary cup passes the compensating port at a relatively low pressure.

Typographical Errors

This notice corrects the typographical errors in S5.1.9(a), S5.1.9(b) and S5.1.12 of Standard No. 116, as proposed in the NPRM.

Effective Date

This rule is effective May 6, 1986. As explained in the NPRM, the agency finds good cause for this expedited effective date because the RM-1 fluid used in the testing procedures of FMVSS Nos. 116 and 106 is commercially unavailable. Use of the RM-66-03 fluid will facilitate compliance testing by utilizing a referee material that is currently available and more representative of fluids in service. However, because the agency is concerned that manufacturers who might still be using RM-1 fluid to test their products should be able to use their existing supplies, use of RM-1 fluid may continue until November 3, 1986, i.e., 180 days after publication of this rule.

In accordance with the above provision permitting the use of RM-1 during the interim period, this rule describes separate test procedures appropriate for use with RM-1 and for the new referee materials (i.e., RM-6603 and TEGME). Test procedures for RM-1 usage are specified for those manufacturers who choose to use that fluid during the 180-day period.

Economic Effects

NHTSA has concluded that this final rule does not qualify as a "major rule" within the meaning of Executive Order 12291, and that it is not "significant" within the meaning of the Department of Transportation's regulatory procedures. Preparation of a regulatory impact analysis is not necessary for this rulemaking. The agency has determined further that the effects of this rulemaking are minor and that a full regulatory evaluation is not warranted. The rule references referee materials in Standards Nos. 116 and 106 that are readily available to manufacturers of brake fluids and brake hoses.

The agency believes that manufacturers will benefit by the change to RM-66-03 fluid and TEGME fluid in FMVSS No. 116 and RM-66-03 fluid in FMVSS No. 106. The fluids are readily available whereas RM-1 is not, and are more representative of fluids in service today. The agency knows of no problems resulting from tests onducted with the RM-66-03 and TEGME fluids.

Some cost savings would be realized with this amendment. The utilization of RM-66-03 fluid will reduce the costs of fluids used in compliance testing without sacrificing adequate test results. For example, as cited in the NPRM, when last available, RM-1 fluid cost approximately $27.00 per quart. The cost of RM-66-03 fluid is approximately $8.00 per quart.

Cost savings will be realized by the use of the TEGME fluid in the humidification tests of FMVSS No. 116. The TEGME fluid costs approximately $3.30 per quart. Further, using the TEGME fluid in compliance testing would conserve the more expensive supply of RM-66-03 brake fluid material.

The change in the stroking test procedures will also result in some cost savings. The costs related to the quantities of materials tested will be reduced about 25 percent.

Any changes to Standard Nos. 106 and 116 referencing the RM-66-03 and TEGME fluids and reducing the number of test materials used in the stroking test will not significantly affect manufacturers of brake hoses and referee materials. These manufacturers may benefit from some cost savings resulting from the changes to the standards, but will not otherwise be significantly affected by this amendment.

In consideration of the foregoing, 49 CFR 571.06, *Brake Hoses,* is amended as follows:

1. S5.3.9 is revised to read as follows:

S5.3.9 *Brake Fluid Compatibility, Construction, and Burst Stength.* Except for brake hose assemblies designed for use with mineral or petroleum-based brake fluids, a hydraulic brake hose assembly shall meet the constriction requirement of S5.3.1 after having been subjected to a temperature of 200°F for 70 hours while filled with SAE RM-66-03 Compatibility Fluid, as described in Appendix A of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983 (S6.7). It shall then withstand water pressure of 4,000 psi for 2 minutes and thereafter shall not rupture at less than 5,000 psi (S6.2). (SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used in place of SAE RM-66-03 until November 3, 1986.

2. Paragraph S6.7.1(a) is revised to read as follows:

S6.7.1 *Preparation.*

(a) Attach a hose assembly below a 1-pint reservoir filled with 100 ml of SAE RM-66-03 Compatibility Fluid as shown in Figure 2. (SAE RM-1

Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used in place of SAE RM-66-03 until November 3, 1986.

* * * * * *

§ 571.116 [Amended]

In consideration of the foregoing, 49 CFR 571.116, *Motor Vehicle Brake Fluids,* is amended as follows:

1. S5.1.9 is revised to read as follows:

S5.1.9 *Water Tolerance.*

(a) *At low temperature.* When brake fluid is tested according to S6.9.3(a)—

(1) * * *

(b) At 60°C (140°F). When brake fluid is tested according to S6.9.3(b)—

(1) * * *

2. S5.1.12 is revised to read as follows:

S5.1.12 *Effects on cups.* When brake cups are subjected to brake fluid in accordance with S6.12—

* * * * * *

3. S5.1.13 is revised to read as follows:

S5.1.13 *Stroking properties.* When brake fluid is tested according to S6.13—

* * * * * *

(c) The average decrease in hardness of seven of the eight cups tested (six wheel cylinder and one master cylinder primary) shall not exceed 15 IRHD. Not more than one of the seven cups shall have a decrease in hardness greater than 17 IRHD;

(d) None of the eight cups shall be in an unsatisfactory operating condition as evidenced by stickiness, scuffing, blisters, cracking, chipping, or other change in shape from its original appearance;

(e) None of the eight cups shall show an increase in base diameter greater than 0.90 mm (0.035 inch):

(f) The average lip diameter set of the eight cups shall not be greater than 65 percent:

* * * * * *

4. S6 is revised to read as follows:

S6. *Test procedures.* Until November 3, 1986, SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used in place of TEGME and SAE RM-66-03 in the humidification (S6.2), chemical stability (S6.5.4), and compatibility (S6.10) test procedures, and as a referee material in S7.2.

* * * * * *

5. S6.2.1 is revised to read as follows:

S6.2.1 *Summary of the procedure.*

(a) *With TEGME:* Except as provided in paragraph S6.2.1(b), a 150 ml sample of the brake fluid is humidified under controlled conditions; 150 ml of SAE triethylene glycol monoethyl ether, brake fluid grade, referee material (TEGME) as described in Appendix E of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983, is used to establish the end point for humidification. After humidification the water content and ERBP of the brake fluid are determined.

(b) *With RM-1:* Until November 3, 1986, SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970, may be used with the following procedures. See S6. A 100-ml. sample of the brake fluid is humidified under controlled conditions: 100 ml of SAE RM-1 Compatibility Fluid is used to establish the end point for humidification. After humidification the water content and ERBP of the brake fluid are detemined.

6. S6.2.2 is revised to read as follows:

S6.2.2 *Apparatus for humidification.* (See Figure 3. Until November 3, 1986, a manufacturer may use either TEGME or RM-1 Compatibility Fluid. If TEGME is used, substitute 450 ml. of distilled water in place of the salt slurry and disregard the "45 ± 7mm" dimension.)

Test apparatus shall consist of—

* * * * * *

7. S6.2.3 is revised to read as follows:

S6.2.3 *Reagents and Materials.*

(a) Distilled water, see S7.1.

(b) Except as provided in S6.2.3(c), SAE TEGME referee material.

(c) Until November 3, 1986, a manufacturer may use either TEGME or SAE RM-1 Compatibility Fluid. See S6.

(d) If RM-1 is used, also use ammonium sulfate $(NH_4)_2SO_4$, Reagent or A.C.S. grade.

8. S6.2.4 is revised to read as follows:

S6.2.4 *Preparation of Apparatus.*

(a) *With TEGME:* Except as provided in S6.2.4(b), lubricate the ground-glass joint of the desiccator. Pour 450 ± 10 ml of distilled water into each desiccator and insert perforated porcelain desiccator plates. Place the desiccators in an oven with temperature controlled at 50 ± 1°C (122 ± 1.8°F) throughout the humidification procedure.

(b) *With RM-1:* Until November 3,1986, a manufacturer may use either TEGME or SAE RM-1 Compatibility Fluid. See S6. Lubricate the ground-glass joint of the desiccator. Load each desiccator with 450±25 grams of the ammonium sulfate and add 125±10 ml. of distilled water. The surface of the salt slurry shall lie within 45±7 mm. of the top surface of the desiccator plate. Place the desiccators in an area with temperature controlled at 23±2° C (73.4±3.6°F) throughout the humidification procedure. Condition the loaded desiccator with the covers on and stoppers in place at least 12 hours before use. Use a fresh charge of salt slurry for each test.

9. S6.2.5 is revised to read as follows:

S6.2.5 *Procedure.*

(a) *With TEGME:* Except as provided by S6.2.5(b), pour 150±5 ml of the brake fluid into an open corrosion test jar. Place the jar into a desiccator. Prepare in the same manner a duplicate test fluid sample and two duplicate specimens of the SAE TEGME referee material (150±5 ml of TEGME in each jar). The water content of the SAE TEGME fluid is adjusted to 0.50±0.05 percent by weight at the start of the test in accordance with S7.2. Place these samples in the dessicators in the 50°C (122°F) controlled oven and replace desiccator covers. At intervals, during oven humidification, remove the rubber stopper in the top of each desiccator containing SAE TEGME fluid. Using a long needled hypodermic syringe, take a sample of not more than 2 ml from each jar and determine its water content. Remove no more than 10 ml of fluid from each SAE TEGME sample during the humidification procedure. When the water content of the SAE fluid reaches 3.70± 0.05 percent by weight (average of the duplicates), remove the two test fluid specimens from their desiccators and promptly cap each jar tightly. Allow the sealed jars to cool for 60–90 minutes at 23±5°C (73.4±9°F). Measure the water contents of the test fluid specimens in accordance with S7.2 and determine their ERBP's in accordance with S6.1. If the two ERBP's agree within 4°C (8°F), average them to determine the wet ERBP: otherwise repeat and average the four individual ERBP's as the wet ERBP of the brake fluid.

(b) *With RM-1:* Until November 3, 1986, a manufacturer may use either TEGME or SAE RM-1 Compatibility Fluid. See S6. Pour 100±1 ml of the brake fluid into a corrosion test jar. Promptly place the jar into a desiccator. Prepare duplicate test sample, and two duplicate specimens of the SAE RM-1 Compatibililty Fluid. Adjust water content of the SAE RM-1 fluid to 0.50±0.05 percent by weight at the start of the test in accordance with S7.2. At intervals remove the rubber stopper in the top of each desiccator containing SAE RM-1 fluid. Using a long needled hypodermic syringe, take a sample of not more than, 2 ml from each jar and determine its water content. Remove no more than 10 ml of fluid from each SAE RM-1 sample during the humidification procedure. When the water content of the RM-1 fluid reaches 3.50±0.05 percent by weight (average of the duplicates), remove the two test fluid specimens from their desiccators and promptly cap each jar tightly. Measure the water contents of the test fluid specimens in accordance with S7.2 and determine their ERBP's in accordance with S6.1 through S6.1.5. If the two ERPB's agree within 4°C. (8°F.), average them to determine the wet ERBP; otherwise repeat and average the four individual ERBP's as the wet ERBP of the brake fluid.)

10. S6.5.4.1 is revised to read as follows:

S6.5.4.1 *Materials.*

(a) Except as provided in S6.5.4.1(b), SAE RM-66-03 Compatibility Fluid, as described in Appendix A of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983.

(b) Until November 3, 1986, a manufacturer may use either SAE RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970. See S6.

11. Paragraph S6.5.4.2 is revised to read as follows:

S6.5.4.2 *Procedure.*

(a) *With RM-66-03:* Except as provided in S6.5.4.2(b), mix 30±1 ml of the brake fluid with 30±1 ml of SAE RM-66-03 Compatibility Fluid in a boiling point flask (S6.1.2(a)). Determine the initial ERBP of the mixture by applying heat to the flask so that the fluid is refluxing in 10±2 minutes at a rate of excess of 1 drop per second, but not more than 5 drops per second. Note the maximum fluid temperature observed during the first minute after the fluid begins refluxing at a rate in excess of 1 drop per second. Over the next 15±1 minutes, adjust and maintain the reflux rate at 1 to 2 drops per second. Maintain this rate for an additional 2 minutes, recording the average value of four temperature readings taken at 30-second intervals as the final ERBP.

(b) *With RM-1:* Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid, " July 1970. See S6.

(c) Thermometer and barometic corrections are not required.

12. S6.10.1 is revised to read as follows:

S6.10.1 *Summary of the procedure.*

(a) *With RM-66-03:* Except as provided in S6.10.1(b), brake fluid is mixed with an equal volume of SAE RM-66-03 Compatibility Fluid, then tested in the same way as for water tolerance (S6.9) except that the bubble flow time is not measured. This test is an indication of the compatibility of the test fluid with other motor vehicle brake fluids at both high and low temperatures.

(b) *With RM-1:* Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b,"Motor Vehicle Brake Fluid," July 1970. See S6. This test is an indication of the compatibility of the test fluid with other motor vehicle brake fluids at both high and low temperatures.

13. Paragraph S6.10..2(e) is revised to read as follows:

S6.10.2 *Apparatus and materials.*

* * * * * *

(e) Except as provided in S6.10.2(f), *SAE RM-66-03 Compatibility Fluid.* As described in Appendix A of SAE Standard J1703, November 1983, "Motor Vehicle Brake Fluid," November 1983.

(f) Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970. See S6.

14. Paragraph S6.10.3(a) is revised to read as follows:

S6.10.3 *Procedure.*

(a) *At low temperature.*

(1) *With RM-66-03:* Except as provided in S6.10.3(a)(2), mix 50±0.5 ml of brake fluid with 50±0.5 ml of SAE RM-66-03 Compatibility Fluid. Pour this mixture into a centrifuge tube and stopper with a clean dry cork. Place tube in the cold chamber maintained at minus 40±2°C (minus 40°±3.6°F). After 24±2 hours, remove tube, quickly wipe with a clean lint-free cloth saturated with ethanol (isopropanol when testing DOT 5 fluids) or acetone. Examine the test specimen for evidence of sludging, sedimentation, or crystallization. DOT 3 and DOT 4 test fluids shall also be examined for stratification.

(2) *With RM-1.* Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, "Motor Vehicle Brake Fluid," July 1970. See S6.

* * * * * *

15. S6.13.1 is revised to read as follows:

S6.13.1 *Summary of the procedure.* Brake fluid is stroked under controlled conditions at an elevated temperature in a simulated motor vehicle hydraulic braking system consisting of three slave wheel cylinders and an actuating master cylinder connected by steel tubing. Referee standard parts are used. All parts are carefully cleaned, examined, and certain measurements made immediately prior to assembly for test. During the test, temperature, rate of pressure rise, maximum pressure, and rate of stroking are specified and controlled. The system is examined periodically during stroking to assure that excessive leakage of fluid is not occurring. Afterwards, the system is torn down. Metal parts and SBR cups are examined and remeasured. The brake fluid and any resultant sludge and debris are collected, examined, and tested.

16. S6.13.2 is revised to read as follows:

S6.13.2 *Apparatus and equipment.*

Either the drum and shoe type of stroking apparatus (see Figure 1 of SAE Standard J1703b) except using only three sets of drum and shoe assemblies, or the stroking fixture type apparatus as shown in Figure 2 of SAE J1703, November 1983, with the components arranged as shown in Figure 1 of SAE J1703, November 1983. The following components are required.

(a) *Brake assemblies.* With the drum and shoe apparatus: three drum and shoe assembly units (SAE RM-29a) consisting of three forward brake shoes and three reverse brake shoes with linings and three front wheel brake drum assemblies with assembly component parts. With stroking fixture type apparatus: three fixture units including appropriate adapter mounting plates to hold brake wheel cylinder assemblies.

* * * * * *

(c) *Heated air bath cabinet.* An insulated cabinet or oven having sufficient capacity to house the three mounted brake assemblies or stroking fixture assemblies, master cylinder, and necessary connections. A thermostatically controlled heating system is required to maintain a temperature of 70° ± 5°C (158° ± 9°F) or 120° ± 5°C (248° ± 9°F). Heaters shall be shielded to prevent direct radiation to wheel or master cylinder.

* * * * * *

(f) *Wheel cylinder (WC) assemblies (SAE RM-14a).* Three unused cast iron housing straight bore hydraulic brake WC assemblies having diameters of approximately 28 mm ($1^1/_8$ inch) for each test. Pistons shall be made from unanodized SAE AA 2024 aluminum alloy.

* * * * * *

17. Paragraph S6.13.3(a) is revised to read as follows:

S6.13.3 *Materials.*

(a) *Standard SBP brake cups.* Six standard SAE SBR wheel cylinder test cups, one primary test cup, and one secondary MC test cup, all as described in S7.6, for each test.

* * * * * *

18. Paragraph S6.13.4(c) is revised to read as follows:

S6.13.4 *Preparation of test apparatus.*

* * * * * *

(c) *Assembly and adjustment of test apparatus.* When using a shoe and drum type apparatus, adjust the brake shoe toe clearances to 1.0 ± 0.1 mm (0.040 ± 0.004 inch). Fill the system with brake fluid, bleeding all wheel cylinders and the pressure gage to remove entrapped air. Operate the actuator manually to apply a pressure greater than the required operating pressure and inspect the system for leaks. Adjust the actuator and/or pressure relief valve to obtain a pressure of 70 ± 3.5 kg./sq. cm. (1,000 ± 50 psi). A smooth pressure-stroke pattern is required when using a shoe and drum type apparatus. The pressure is relatively low during the first part of the stroke and then builds up smoothly to the maximum stroking pressure at the end of the stroke, to permit the primary cup to pass the compensating hole at a relatively low pressure. Using stroking fixtures, adjust the actuator and/or pressure relief valve to obtain a pressure of 70 ± 3.5 kg./sq. cm. (1,000 ± 50 psi).

Adjust the stroking rate to 1,000 ± 100 strokes per hour. Record the fluid level in the master cylinder standpipe.

19. S6.13.6(b) and S6.13.6(c) are revised to read as follows:

S6.13.6 *Calculation.*

* * * * * *

(b) Calculate the average decrease in hardness of the seven cups tested, as well as the individual values (see S5.1.13(c)).

(c) Calculate the increases in base diameters of the eight cups (see S5.1.13(e)).

20. The first sentence of Paragraph S6.13.6(d) is revised to read as follows:

(d) Calculate the lip diameter interference set for each of the eight cups by the following formula and average the eight values (see S5.1.13(f)).

* * * * * *

21. S7.2 is revised to read as follows:

S7.2 *Water content of motor vehicle brake fluids.* Use analytical methods based on ASTM D1123-59, "Standard Method of Test for Water in Concentrated Engine Antifreezes by the Iodine Reagent Method," for determining the water content of brake fluids, or other methods of analysis yielding comparable results. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM-66-03 and TEGME Compatibility Fluids within ± 15 percent of the water added for additions up to 0.8 percent by weight, and within ± 5 percent of the water added for additions greater than 0.8 percent by weight The SAE RM-66-03 Compatibility Fluid used to prepare the samples must have an original ERBP of not less than 205°C (401°F) when tested in accordance with S6.1. The SAE TEGME fluid used to prepare the samples must have an original ERBP of not less than 240°C (464°F) when tested in accordance with S6.1.

Until November 3, 1986, a manufacturer may use either RM-66-03 and TEGME or SAE RM-1 Compatibility Fluid. See S6. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM-1 Compatibility Fluid within ± 15 percent of the water added for additions up to 0.8 percent by weight, and within ± 5 percent of the water added for additions greater than 0.8 percent by weight. The SAE RM-1 Compatibility Fluid used to prepare the samples must have an original ERBP of not less than 182°C (360°F) when tested in accordance with S6.1.

Issued on April 29, 1986.

Diane K. Steed
Administrator

51 F.R. 16694
May 6, 1986

MOTOR VEHICLE SAFETY STANDARD NO. 116

Motor Vehicle Brake Fluids—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, Buses, and Motorcycles, and Brake Fluid and Brake Fluid Containers

(Docket No. 70-23; Notice 3)

S1. Scope. This standard specifies requirements for fluids for use in hydraulic brake systems of motor vehicles, containers for these fluids, and labeling of the containers.

S2. Purpose. The purpose of this standard is to reduce failures in the hydraulic braking systems of motor vehicles which may occur because of the manufacture or use of improper or contaminated fluid.

S3. Application. This standard applies to all fluid for use in hydraulic brake systems of motor vehicles. In addition, S5.3 applies to passenger cars, multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles.

S4. Definitions.

"Blister" means a cavity or sac on the surface of a brake cup.

"Brake fluid" means a liquid designed for use in a motor vehicle hydraulic brake system in which it will contact elastomeric components made of styrene and butadiene rubber (SBR), ethylene and propylene rubber (EPR), polychloroprene (CR) brake hose inner tube stock or natural rubber (NR).

"Chipping" means a condition in which small pieces are missing from the outer surface of a brake cup.

"Hydraulic system mineral oil" means a mineral-oil-based fluid designed for use in motor vehicle hydraulic brake systems in which the fluid is not in contact with components made of SBR, EPR or NR.

"Duplicate samples" means 2 samples of brake fluid taken from a single packaged lot and tested simultaneously.

"Packager" means any person who fills containers with brake fluid that are subsequently distributed for retail sale.

"Packaged lot" is that quantity of brake fluid shipped by the manufacturer to the packager in a single container, or that quantity of brake fluid manufactured by a single plant run of 24 hours or less, through the same processing equipment and with no change in ingredients.

"Scuffing" means a visible erosion of a portion of the outer surface of a brake cup.

"Sloughing" means degradation of a brake cup as evidenced by the presence of carbon black loosely held on the brake cup surface, such that a visible black streak is produced when the cup, with a 500 ± 10 gram dead weight on it, is drawn base down over a sheet of white bond paper placed on a firm flat surface.

"Stickiness" means a condition on the surface of a brake cup such that fibers will be pulled from a wad of U.S.P. absorbent cotton when it is drawn across the surface.

S5. Requirements. This section specifies performance requirements for DOT 3, DOT 4 and DOT 5 brake fluids, requirements for brake fluid certification, and for container sealing, labeling and color coding for both brake fluids and hydraulic system mineral oils. Where a range of tolerances is specified, the brake fluid must be capable of meeting the requirements at all points within the range.

S5.1 Brake fluid. When tested in accordance with S6, brake fluids shall meet the following requirements.

S5.1.1 Equilibrium reflux boiling point (ERBP). When brake fluid is tested according to S6.1, the ERBP shall not be less than the following value for the grade indicated:

(a) DOT 3: 205°C (401°F)

(b) DOT 4: 230°C (446°F)

(c) DOT 5: 260°C (500°F)

S5.1.2 Wet ERBP. When brake fluid is tested according to S6.2, the wet ERBP shall not be less than the following value for the grade indicated:

(a) DOT 3: 140°C (284°F)

(b) DOT 4: 155°C (311°F)

(c) DOT 5: 180°C (356°F)

S5.1.3 Kinematic viscosities. When brake fluid is tested according to S6.3, the kinematic viscosities in centistokes (cSt) at stated temperatures shall be neither less than 1.5 cSt at 100° C. (212° F.) nor more than the following maximum value for the grade indicated:

(a) DOT 3: 1500 cSt at minus 40°C (minus 40° F)

(b) DOT 4: 1800 cSt at minus 40°C (minus 40° F)

(c) DOT 5: 900 cSt at minus 40°C (minus 40° F)

S5.1.4 pH value. When DOT 3 or DOT 4 brake fluid is tested according to S6.4, the pH value shall not be less than 7.0 or more than 11.5.

S5.1.5 Brake fluid stability.

S5.1.5.1 High-temperature stability. When brake fluid is tested according to S.6.5.3 the ERBP shall not change by more than 3.0°C (5.4°F) plus 0.05 degree for each degree that the ERBP of the fluid exceeds 225°C (437°F).

S5.1.5.2 Chemical stability. When DOT 3 or DOT 4 brake fluid is tested according to S6.5.4, the change in temperature of the refluxing fluid mixture shall not exceed 3.0°C (5.4°F) plus 0.05 degree for each degree that the ERBP of the fluid exceeds 225°C (437°F).

S5.1.6 Corrosion. When brake fluid is tested according to S.6.6—

(a) The metal test strips shall not show weight changes exceeding the limits stated in Table I.

TABLE 1

Test strip material	*Max. permissible weight change, mg/sq cm of surface*
Steel, Tinned Iron, Cast Iron	0.2
Aluminum	0.1
Brass, Copper	0.4

(b) Excluding the area of contact (13±1 mm. (1/2±1/32 inch) measured from the bolt hole end of the test strip), the metal test strips shall not show pitting or etching to an extent discernible without magnification;

(c) The water-wet brake fluid at the end of the test shall show no jelling at 23±5°C (73.4±9°F);

(d) No crystalline deposit shall form and adhere to either the glass jar walls or the surface of the metal strips;

(e) At the end of the test, sedimentation of the water-wet brake fluid shall not exceed 0.10 percent by volume;

(f) The pH value of water-wet DOT 3 and DOT 4 brake fluid at the end of the test shall not be less than 7.0 nor more than 11.5;

(g) The cups at the end of the test shall show no disintegration, as evidenced by blisters or sloughing;

(h) The hardness of the cup shall not decrease by more than 15 International Rubber Hardness Degrees (IRHD); and

(i) The base diameter of the cups shall not increase by more than 1.4 mm. (0.055 inch).

S5.1.7 Fluidity and appearance at low temperature. When brake fluid is tested according to S6.7, at the storage temperature and for the storage times given in Table II—

(a) The fluid shall show no sludging, sedimentation, crystallization, or stratification;

(b) Upon inversion of the sample bottle, the time required for the air bubble to travel to the top of the fluid shall not exceed the bubble flow times shown in Table II; and

(c) On warming to room temperature, the fluid shall resume the appearance and fluidity that it had before chilling.

TABLE II—Fludity and Appearance at Low Temperatures

Storage temperature	*Storage time (hours)*	*Max. bubble flow time (seconds)*
minus 40±2°C (minus 40±3.6°F)	144±4.0	10
minus 50±2°C (minus 58±3.6°F)	6±0.2	35

S5.1.8 Evaporation. When brake fluid is tested according to S6.8—

(a) The loss by evaporation shall not exceed 80 percent by weight;

(b) The residue from the brake fluid after evaporation shall contain no precipitate that remains gritty or abrasive when rubbed with the fingertip; and

(c) The residue shall have a pour point below minus 5°C (+23°F).

S5.1.9 Water tolerance.

(a) *At low temperature.* When brake fluid is tested according to [S6.9.3(a)—]

(1) The fluid shall show no sludging, sedimentation, crystallization, or stratification;

(2) Upon inversion of the centrifuge tube, the air bubble shall travel to the top of the fluid in not more than 10 seconds;

(3) If cloudiness has developed, the wet fluid shall regain its original clarity and fluidity when warmed to room temperature; and

(b) *At 60° C. (140° F.).* When brake fluid is tested according to [S6.9.3(b)—]

(1) The fluid shall show no stratification; and

(2) Sedimentation shall not exceed 0.15 percent by volume after centrifuging.

S5.1.10 Compatibility.

(a) *At low temperature.* When brake fluid is tested according to S6.10.3(a) the test specimen shall show no sludging, sedimentation, or crystallization. In addition DOT 3 and DOT 4 fluids shall show no stratification.

(b) *At 60° C. (140° F.).* When brake fluid is tested according to S6.10.3(b)—

(1) Sedimentation shall not exceed 0.05 percent by volume after centrifuging; and

(2) DOT 3 and DOT 4 fluids shall show no stratification.

S5.1.11 Resistance to oxidation. When brake fluid is tested according to S6.11—

(a) The metal test strips outside the areas in contact with the tinfoil shall not show pitting or etching to an extent discernible without magnification;

(b) No more than a trace of gum shall be deposited on the test strips outside the areas in contact with the tinfoil;

(c) The aluminum strips shall not change in weight by more than 0.05 mg/sq cm; and

(d) The cast iron strips shall not change in weight by more than 0.3 mg/sq cm.

S5.1.12 Effects on cups. When brake cups are subjected to brake fluid in accordance with [S6.12]—

(a) The increase in the diameter of the base of the cups shall be not less than 0.15 mm (0.006 inch) or more than 1.40 mm (0.055 inch);

(b) The decrease in hardness of the cups shall be not more than 10 IRHD at 70°C (158°F) or more than 15 IRHD at 120°C (248°F), and there shall be no increase in hardness of the cups; and

(c) The cups shall show no disintegration as evidenced by stickiness, blisters, or sloughing.

S5.1.13 Stroking properties. When brake fluid is tested according to S6.13—

(a) Metal parts of the test system shall show no pitting or etching to an extent discernible without magnification;

(b) The change in diameter of any cylinder or piston shall not exceed 0.13 mm (0.005 inch);

[(c) The average decrease in hardness of seven of the eight cups tested (six wheel cylinder and one master cylinder primary) shall not exceed 15 IRHD. Not more than one of the seven cups shall have a decrease in hardness greater than 17 IRHD;

(d) None of the eight cups shall be in an unsatisfactory operating condition as evidenced by stickiness, scuffing, blisters, cracking, chipping, or other change in shape from its original appearance;

(e) None of the eight cups shall show an increase in base diameter greater than 0.90 mm (0.035 inch);

(f) The average lip diameter set of the eight cups shall not be greater than 65 percent; **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(g) During any period of 24,000 strokes, the volume loss of fluid shall not exceed 36 milliliters;

(h) The cylinder pistons shall not freeze or function improperly throughout the test;

(i) The total loss of fluid during the 100 strokes at the end of the test shall not exceed 36 milliliters;

(j) The fluid at the end of the test shall show no formation of gels;

(k) At the end of the test the amount of sediment shall not exceed 1.5 percent by volume; and

(l) Brake cylinders shall be free of deposits that are abrasive or that cannot be removed when rubbed moderately with a nonabrasive cloth wetted with ethanol.

S5.1.14 Fluid color. Brake fluid and hydraulic system mineral oil manufactured on or after September 1, 1978, shall be of the color indicated:

DOT 3 and DOT 4—colorless to amber.
DOT 5—purple.
Hydraulic system mineral oil—green.

S5.2 Packaging and labeling requirements for motor vehicle brake fluids.

S5.2.1 Container sealing. Each brake fluid or hydraulic system mineral oil container with a capacity of 6 fluid ounces or more shall be provided with a resealable closure that has an inner seal impervious to the packaged brake fluid. The container closure shall include a tamper-proof feature that will either be destroyed or substantially altered when the container closure is initially opened.

S5.2.2 Certification, marking, and labeling.

S5.2.2.1 Each manufacturer of a DOT grade brake fluid shall furnish to each packager, distributor, or dealer to whom he delivers brake fluid, the following information:

(a) A serial number identifying the production lot and the date of manufacture of the brake fluid.

(b) The grade (DOT 3, DOT 4, or DOT 5) of the brake fluid.

(c) The minimum wet boiling point in Fahrenheit of the brake fluid.

(d) Certification that the brake fluid conforms to Federal Motor Vehicle Safety Standard No. 116.

S5.2.2.2 Each packager of a brake fluid shall furnish the following information clearly and indelibly marked on each brake fluid container, in any location except a removable part such as a lid.

(a) Certification that the brake fluid conforms to Federal Motor Vehicle Safety Standard No. 116.

(b) The name of the packager of the brake fluid, which may be in code form.

(c) The name and complete mailing address of the distributor.

(d) A serial number identifying the packaged lot and date of packaging.

(e) Designation of the contents as "DOT __ __ __ MOTOR VEHICLE BRAKE FLUID" (Fill in "3", "4", or "5" as applicable.)

(f) The minimum wet boiling point in Fahrenheit of the DOT brake fluid in the container.

(g) The following safety warnings in capital and lower case letters as indicated:

(1) FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING BRAKE FLUID.

(2) KEEP BRAKE FLUID CLEAN AND DRY. Contamination with dirt, water, petroleum products or other materials may result in brake failure or costly repairs.

(3) STORE BRAKE FLUID ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED TO PREVENT ABSORPTION OF MOISTURE. (The last five words of the second sentence may be omitted from the labeling on DOT 5 containers.)

(4) *CAUTION:* DO NOT REFILL CONTAINER, AND DO NOT USE FOR OTHER LIQUIDS. (Not required for containers with a capacity in excess of 5 gallons.)

S5.2.2.3 Each packager of hydraulic system mineral oil shall furnish the following information clearly and indelibly marked on each container in any location except a removable part such as a lid:

(a) The name of the packager of the hydraulic system mineral oil, which may be in code form.

(b) The name and complete mailing address of the distributor.

(c) A serial number identifying the packaged lot and date of packaging.

(d) Designation of the contents as "HYDRAULIC SYSTEM MINERAL OIL" in capital letters at least ⅛ of an inch high.

(e) The following safety warnings in capital and lower case letters as indicated:

(1) FOLLOW VEHICLE MANUFACTURER'S RECOMMENDATIONS WHEN ADDING HYDRAULIC SYSTEM MINERAL OIL.

(2) Hydraulic System Mineral Oil is *NOT COMPATIBLE* with the rubber components of brake systems designed for use with DOT brake fluids.

(3) KEEP HYDRAULIC SYSTEM MINERAL OIL CLEAN. Contamination with dust or other materials may result in brake failure or costly repair.

(4) CAUTION: STORE HYDRAULIC SYSTEM MINERAL OIL ONLY IN ITS ORIGINAL CONTAINER. KEEP CONTAINER CLEAN AND TIGHTLY CLOSED. DO NOT REFILL CONTAINER OR USE OTHER LIQUIDS. (The last sentence is not required for container with a capacity in excess of 5 gallons.)

S5.2.2.4 If a container for brake fluid or hydraulic system mineral oil is not normally visible but designed to be protected by an outer container or carton during use, the outer container or carton rather than the inner container shall meet the labeling requirements of S5.2.2.2 or S5.2.2.3, as appropriate.

S5.3 Motor vehicle requirement. Each passenger car, multipurpose passenger vehicle, truck, bus, trailer, and motorcycle that has a hydraulic brake system shall be equipped with fluid that has been manufactured and packaged in conformity with the requirements of this standard.

S6. Test procedures. [Until November 3, 1986, SAE RM-1 Compatibility Fluid, as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970, may be used in place of TEGME and SAE RM-66-03 in the humidification (S6.2), chemical stability (S6.5.4), and compatibility (S6.10) test procedures, and as a referee material in S7.2. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

S6.1 Equilibrium reflux boiling point. Determine the ERBP of a brake fluid by running duplicate samples according to the following procedure and averaging the results.

S6.1.1 Summary of procedure. Sixty milliliters (ml) of brake fluid are boiled under specified equilibrium conditions (reflux) at atmospheric pressure in a 100-ml flask. The average temperature of the boiling fluid at the end of the reflux period, corrected for variations in barometric pressure if necessary, is the ERBP.

S6.1.2 Apparatus. (See Figure 1) The test apparatus shall consist of—

(a) *Flask.* (See Figure 2) A 100-ml roundbottom, short-neck heat-resistant glass flask having a neck with a 19/38 standard taper, female ground-glass joint and a side-entering tube, with an outside diameter of 10 millimeters (mm), which centers the thermometer bulb in the flask 6.5 mm from the bottom;

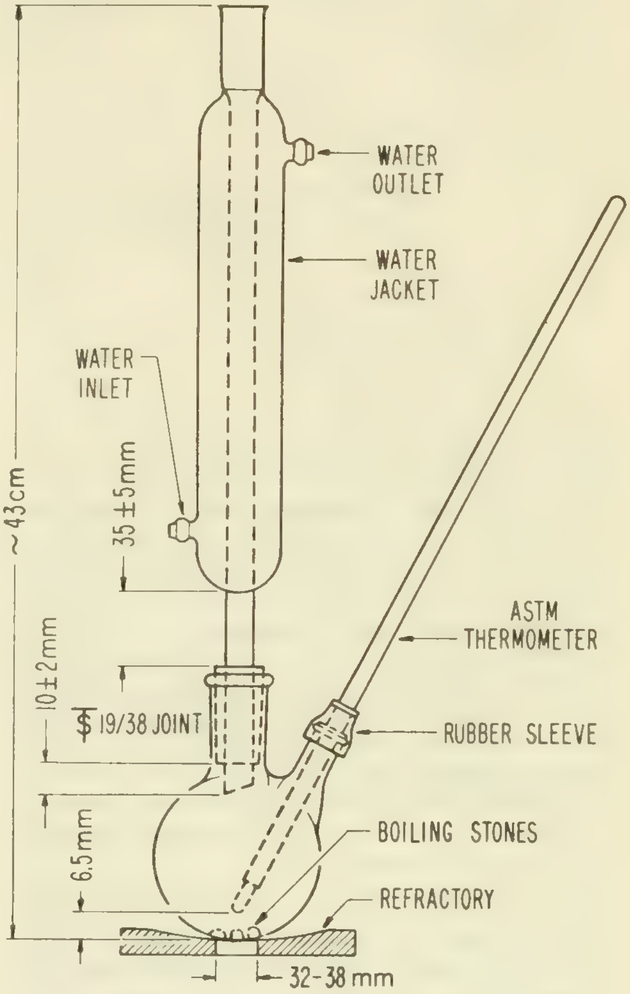


FIG. 1
BOILING POINT TEST APPARATUS

(b) *Condenser.* A water-cooled, reflux, glass-tube-type condenser having a jacket 200 mm in length, the bottom end of which has a 19/38 standard-taper, drip-tip, male ground-glass joint;

(c) *Boiling stones.* Three clean, unused silicon carbide grains (approximately 2 mm (0.08 inch) in diameter, grit No. 8);

(d) *Thermometer.* Standardized calibrated partial immersion (76 mm), solid stem, thermometers conforming to the requirements for an ASTM 2C or 2F, and an ASTM 3C or 3F thermometer; and

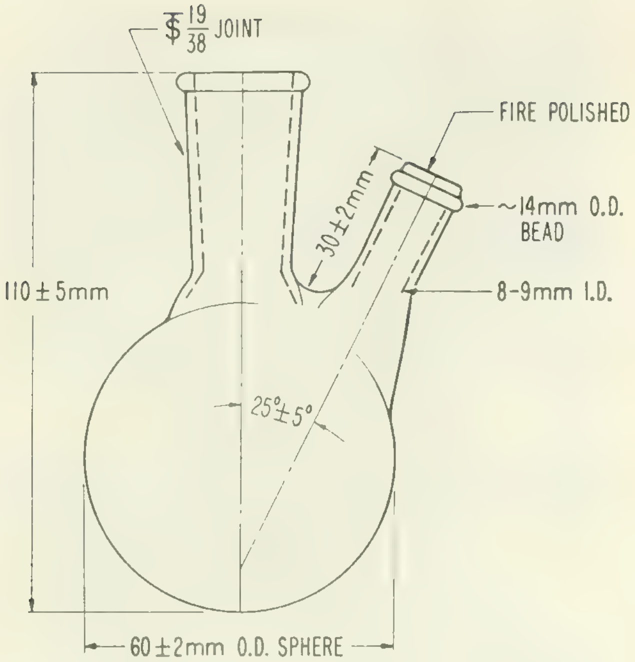


FIG. 2

DETAIL OF 100ml SHORT-NECK FLASK

(e) *Heat source.* Variable autotransformer-controlled heating mantle designed to fit the flask, or an electric heater with rheostat heat control.

S6.1.3 Preparation of apparatus.

(a) Thoroughly clean and dry all glassware.

(b) Insert thermometer through the side tube until the tip of the bulb is 6.5 mm (¼ inch) from the bottom center of the flask. Seal with a short piece of natural rubber, EPDM, SBR or butyl tubing.

(c) Place 60±1 ml of brake fluid and the silicon carbide grains into the flask.

(d) Attach the flask to the condenser. When using a heating mantle, place the mantle under the flask and support it with a ring-clamp and laboratory-type stand, holding the entire assembly in place by a clamp. When using a rheostat-controlled heater, center a standard porcelain or hard asbestos refractory, having a diameter opening 32 to 38 mm, over the heating element and mount the flask so that direct heat is applied only through the opening in the refractory. Place the assembly in an area free from drafts or other types of sudden temperature changes. Connect the cooling water inlet and outlet tubes to the condenser. Turn on the cooling water. The water supply temperature shall not exceed 28°C (82.4°F) and the temperature rise through the condenser shall not exceed 2°C (3.6°F).

S6.1.4 Procedure for preparation of apparatus. Apply heat to the flask so that within 10±2 minutes the fluid is refluxing in excess of 1 drop per second. The reflux rate shall not exceed 5 drops per second at any time. Immediately adjust the heating rate to obtain an equilibrium reflux rate of 1 to 2 drops per second over the next 5±2 minutes. Maintain this rate for an additional 2 minutes, taking four temperature readings at 30-second intervals. Record the average of these as the observed ERBP. If no reflux is evident when the fluid temperature reaches 260°C (500°F), discontinue heating and report ERBP as in excess of 260°C (500°F).

S6.1.5 Calculation.

(a) *Thermometer inaccuracy.* Correct the observed ERBP by applying any correction factor obtained in standardizing the thermometer.

(b) *Variation from standard barometric pressure.* Apply the factor shown in Table III to calculate the barometric pressure correction to the ERBP.

(c) If the two corrected observed ERBP's agree within 2.0°C (4.0°C for brake fluids having an ERBP over 230°C/446°F) average the duplicate runs as the ERBP; otherwise, repeat the entire test, averaging the four corrected observed values to determine the original ERBP.

TABLE III.—Correction for Barometric Pressure

Observed ERBP corrected for thermometer inaccuracy	*Correction per 2 mm difference in pressure*[a] *°C.*	*(°F.)*
100°C (212°F) to 190°C (374°F)	0.039	(0.07)
Over 190°C (374°F)	0.04	(0.08)

[a] To be added in case barometric pressure is below 760 mm; to be subtracted in case barometric pressure is above 760 mm.

S6.2 Wet ERBP. Determine the wet ERBP of a brake fluid by running duplicate samples according to the following procedure.

[S6.2.1 Summary of the procedure.

(a) *With TEGME:* Except as provided in paragraph S6.2.1(b), a 150 ml sample of the brake fluid is humidified under controlled conditions; 150 ml of SAE triethylene glycol monoethyl ether, brake fluid grade, referee material (TEGME) as described in Appendix E of SAE Standard J1703, November 1983, *Motor Vehicle Brake Fluid,* November 1983, is used to establish the end point for humidification. After humidification the water content and ERBP of the brake fluid are determined.

(b) *With RM-1:* Until November 3, 1986, SAE RM-1 *Compatibility Fluid,* as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970, may be used with the following procedures. See S6. A 100-ml sample of the brake fluid is humidified under controlled conditions: 100 ml of SAE RM-1 *Compatibility Fluid* is used to establish the end point for humidification. After humidification the water content and ERBP of the brake fluid are determined.

S6.2.2 Apparatus for humidification. (See Figure 3.) Until November 3, 1986, a manufacturer may use either TEGME or RM-1 *Compatibility Fluid.* If TEGME is used, substitute 450 ml of distilled water in place of the salt slurry and disregard the "45 ± 7mm" dimension. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

Test apparatus shall consist of—

(a) *Glass jars.* Four SAE RM-49 corrosion test jars or equivalent screw-top, straight-sided, round glass jars each having a capacity of about 475 ml and approximate inner dimensions of 100 mm in height by 75 mm in diameter, with matching lids having new, clean inserts providing water-vapor-proof seals;

(b) *Desiccator and cover.* Four bowl-form glass desiccators, 250 mm inside diameter, having matching tubulated covers fitted with No. 8 rubber stoppers; and

(c) *Descicator plact.* Four 230-mm diameter, perforated porcelain desiccator plates, without feet, glazed on one side.

S6.2.3 Reagents and Materials.

[(a) Distilled water, see S7.1.

(b) Except as provided in S6.2.3(c), SAE TEGME referee material.

(c) Until November 3, 1986, a manufacturer may use either TEGME or SAE RM-1 *Compatibility Fluid.* See S6.

(d) If RM-1 is used, also use ammonium sulfate $(NH_4)_2SO_4$. Reagent or A.C.S. grade.

S6.2.4 Preparation of Apparatus.

(a) *With TEGME:* Except as provided in S6.2.4(b), lubricate the ground-glass joint of the desiccator. Pour 450 ± 10 ml of distilled water into each desiccator and insert perforated porcelain desiccator plates. Place the desiccators in an oven with temperature controlled at 50 ± 1°C (122 ± 1.8°F) throughout the humidification procedure.

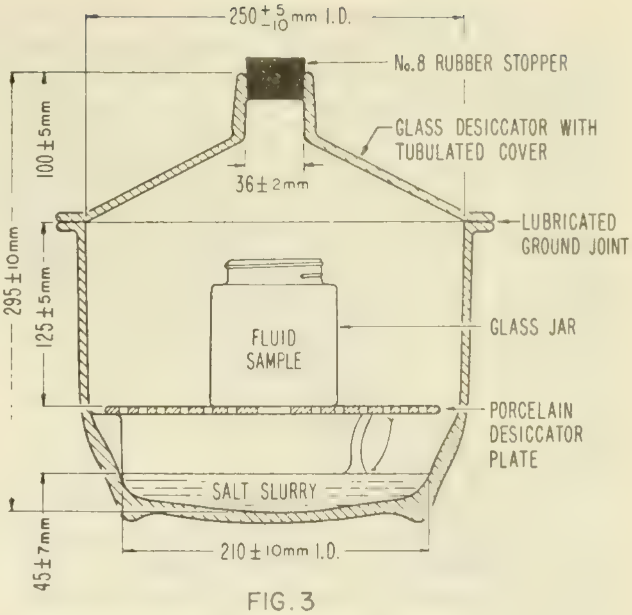


FIG. 3
HUMIDIFICATION APPARATUS

(b) *With RM-1:* Until November 3, 1986, a manufacturer may use either TEGME or SAE RM-1 *Compatibility Fluid.* See S6. Lubricate the ground-glass joint of the desiccator. Load each desiccator with 450 ± 25 grams of the ammonium sulfate and add 125 ± 10 ml of distilled water. The surface of the salt slurry shall lie within 45 ± 7 mm of the top surface of the desiccator plate. Place the desiccators in an area with temperature controlled at 23 ± 2°C (73.4 ± 3.6°F) throughout the humidification procedure. Condition the loaded desiccator with the covers on and stoppers in place at least 12 hours before use. Use a fresh charge of salt slurry for each test.

S6.2.5 Procedure.

(a) *With TEGME:* Except as provided by S6.2.5(b), pour 150 ± 5 ml of the brake fluid into an open corrosion test jar. Place the jar into a desiccator. Prepare in the same manner a duplicate test fluid sample and two duplicate specimens of the SAE TEGME referee material (150 ± 5 ml of TEGME in each jar). The water content of the SAE TEGME fluid is adjusted to 0.50 ± 0.05 percent by weight at the start of the test in accordance with S7.2. Place these samples in the dessicators in the 50°C (122°F) controlled oven and replace desiccator covers. At intervals, during oven humidification, remove the rubber stopper in the top of each desiccator containing SAE TEGME fluid. Using a long-needled hypodermic syringe, take a sample of not more than 2 ml from each jar and determine its water content. Remove no more than 10 ml of fluid from each SAE TEGME sample during the humidification procedure. When the water content of the SAE fluid reaches 3.70±0.05 percent by weight (average of the duplicates), remove the two test fluid specimens from their desiccators and promptly cap each jar tightly. Allow the sealed jars to cool for 60–90 minutes at 23±5°C (73.4±9°F). Measure the water contents of the test fluid specimens in accordance with S7.2 and determine their ERBP's in accordance with S6.1. If the two ERBP's agree within 4°C (8°F), average them to determine the wet ERBP; otherwise repeat and average the four individual ERBP's as the wet ERBP of the brake fluid.

(b) *With RM-1:* Until November 3, 1986, a manufacturer may use either TEGME or SAE RM-1 *Compatibility Fluid.* See S6. Pour 100±1 ml of the brake fluid into a corrosion test jar. Promptly place the jar into a desiccator. Prepare duplicate test sample, and two duplicate specimens of the SAE RM-1 *Compatibility Fluid.* Adjust water content of the SAE RM-1 fluid to 0.50±0.05 percent by weight at the start of the test in accordance with S7.2. At intervals remove the rubber stopper in the top of each desiccator containing SAE RM-1 fluid. Using a long-needled hypodermic syringe, take a sample of not more than 2 ml from each jar and determine its water content. Remove no more than 10 ml of fluid from each SAE RM-1 sample during the humidification procedure. When the water content of the RM-1 fluid reaches 3.50±0.05 percent by weight (average of the duplicates), remove the two test fluid specimens from their desiccators and promptly cap each jar tightly. Measure the water contents of the test fluid specimens in accordance with S7.2 and determine their ERBP's in accordance with S6.1 through S6.1.5. If the two ERPB's agree within 4°C. (8°F.), average them to determine the wet ERBP; otherwise repeat and average the four individual ERBP's as the wet ERBP of the brake fluid.) **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

S6.3 Kinematic viscosity. Determine the kinematic viscosity of a brake fluid in centistokes (cSt) by the following procedure. Run duplicate samples at each of the specified temperatures, making two timed runs on each sample.

S6.3.1 Summary of the procedure. The time is measured for a fixed volume of the brake fluid to flow through a calibrated glass capillary viscometer under an accurately reproducible head and at a closely controlled temperature. The kinematic viscosity is then calculated from the measured flow time and the calibration constant of the viscometer.

S6.3.2 Apparatus.

(a) *Viscometers.* Calibrated glass capillary-type viscometers, ASTM D2515–66, *Standard Specification for Kinematic Glass Viscometers,* measuring viscosity within the precision limits of S6.4.7. Use suspended level viscometers for viscosity measurements at low temperatures. Use Cannon-Fenske Routine or other modified Ostwald viscometers at ambient temperatures and above.

(b) *Viscometer holders and frames.* Mount a viscometer in the constant-temperature bath so that the mounting tube is held within 1 degree of the vertical.

(c) *Viscometer bath.* A transparent liquid bath of sufficient depth such that at no time during the measurement will any portion of the sample in the viscometer be less than 2 cm below the surface or less than 2 cm above the bottom. The bath shall be cylindrical in shape, with turbulent agitation sufficient to meet the temperature control requirements. For measurements within 15 to 100° C. (60 to 212°F) the temperature of the bath medium shall not vary by more than 0.01°C (0.02°F) over the length of the viscometers, or between the positions of the viscometers, or at the locations of the thermometers. Outside this range, the variation shall not exceed 0.03°C (0.05°F).

(d) *Thermometers.* Liquid-in-glass Kinematic Viscosity Test Thermometers, covering the range of test temperatures indicated in Table IV and conforming to ASTM E1–68, *Specifications for ASTM Thermometers,* and in the IP requirements for IP Standard Thermometers. Standardize before use (see S6.3.3(b)). Use two standardized thermometers in the bath.

(e) *Timing device.* Stop watch or other timing device graduated in divisions representing not more than 0.2 second, with an accuracy of at least ±0.05 percent when tested over intervals of 15 minutes. Electrical timing devices may be used when the current frequency is controlled to an accuracy of 0.01 percent or better.

S6.3.3 Standardization.

(a) *Viscometers.* Use viscometers calibrated in accordance with Appendix 1 of ASTM D445–65, *Viscosity of Transparent and Opaque Liquids*

TABLE IV

Kinematic Viscosity Thermometers

Temperature range		*For tests at*		*Subdivisions*		*Thermometer number*	
deg C.	deg F.	deg C.	deg F.	deg C.	deg F.	ASTM	IP
minus 55.3 to minus 52.5	minus 67.5 to minus 62.5	minus 55	minus 67	0.05	0.1	74 F.	69 F. or C.
minus 41.4 to minus 38.6	minus 42.5 to minus 37.5	minus 40	minus 40	0.05	0.1	73 F.	68 F. or C.
98.6 to 101.4	207.5 to 212.5	100	212	0.05	0.1	30 F.	32 F. or C.

(Kinematic and Dynamic Viscosities.) The calibration constant, C, is dependent upon the gravitational acceleration at the place of calibration. This must, therefore, be supplied by the standardization laboratory together with the instrument constant. Where the acceleration of gravity, g, in the two locations differs by more than 0.1 percent, correct the calibration constant as follows:

$$C_2 = \frac{g_2}{g_1} \times C_1$$

where the subscripts 1 and 2 indicate respectively the standardization laboratory and the testing laboratory.

(b) *Thermometers.* Check liquid-in-glass thermometers to the nearest 0.01°C (0.02°F) by direct comparison with a standardized thermometer. Kinematic Viscosity Test Thermometers shall be standardized at "total immersion." The ice point of standardized thermometers shall be determined before use and the official corrections shall be adjusted to conform to the changes in ice points. (See ASTM E77–66, *Verification and Calibration of Liquid-in-Glass Thermometers.*)

(c) *Timers.* Time signals are broadcast by the National Bureau of Standards, Station WWV, Washington, D.C., at 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc/sec (MH_z). Time signals are also broadcast by Station CHU from Ottawa, Canada, at 3.330, 7.335 and 14.670 Mc/sec, and Station MSF at Rugby, United Kingdom, at 2.5, 5 and 10 Mc/sec.

S6.3.4 Procedure.

(a) Set and maintain the bath at the appropriate test temperature (see S5.1.3) within the limits specified in S6.3.2(c). (Apply the necessary corrections, if any, to all thermometer readings.

(b) Select a clean, dry, calibrated viscometer giving a flow time not less than its specified minimum, or 200 seconds, whichever is the greater.

(c) Charge the viscometer in the manner used when the instrument was calibrated. Do not filter or dry the brake fluid, but protect it from contamination by dirt and moisture during filling and measurements.

(1) Charge the suspended level viscometers by tilting about 30 degrees from the vertical and pouring sufficient brake fluid through the fill tube into the lower reservoir so that when the viscometer is returned to vertical position the meniscus is between the fill marks. For measurements below 0°C (32°F), before placing the filled viscometer into the constant temperature bath, draw the sample into the working capillary and timing bulb and insert small rubber stoppers to suspend the fluid in this position, to prevent accumulation of water condensate on the walls of the critical portions of the viscometer. Alternatively, fit loosely packed drying tubes onto the open ends of the viscometer to prevent water condensation, but do not restrict the flow of the sample under test by the pressures created in the instrument.

(2) If a Cannon-Fenske Routine viscometer is used, charge by inverting and immersing the smaller arm into the brake fluid and applying vacuum to the larger arm. Fill the tube to the upper timing mark, and return the viscometer to an upright position.

(d) Mount the viscometer in the bath in a true vertical position (See S6.3.2(b)).

(e) The viscometer shall remain in the bath until it reaches the test temperature.

(f) At temperature below 0°C (32°F) conduct an untimed preliminary run by allowing the brake fluid to drain through the capillary into the lower reservoir after the test temperature has been established.

(g) Adjust the head level of the brake fluid to a position in the capillary arm about 5 mm above the first timing mark.

(h) With brake fluid flowing freely measure to within 0.2 second the time required for the meniscus to pass from the first timing mark to the second. If this flow time is less than the minimum specified for the viscometer, or 200 seconds, whichever is greater, repeat using a viscometer with a capillary of smaller diameter.

(i) Repeat S6.3.4(g) and (h). If the two timed runs do not agree within 0.2 percent, reject and repeat using a fresh sample of brake fluid.

S6.3.5 Cleaning of viscometers.

(a) Periodically clean the instrument with chromic acid to remove organic deposits. Rinse thoroughly with distilled water and acetone, and dry with clean dry air.

(b) Between successive samples rinse the viscometer with ethanol (isopropanol when testing DOT 5 fluids) followed by an acetone or ether rinse. Pass a slow stream of filtered dry air through the viscometer until the last trace of solvent is removed.

S6.3.6 Calculation.

(a) The following viscometers have a fixed volume charged at ambient temperature, and as a consequence C varies with test temperature: Cannon-Fenske Routine, Pinkevitch, Cannon Manning Semi-Micro, and Cannon Fenske Opaque. To calculate C at test temperatures other than the calibration temperature for these viscometers, see ASTM D2515–66, *Kinematic Glass Viscometers*, or follow instructions given on the manufacturer's certificate of calibration.

(b) Average the four timed runs on the duplicate samples to determine the kinematic viscosities.

S6.3.7 Precision (at 95 percent confidence level).

(a) *Repeatability*. If results on duplicate samples by the same operator differ by more than 1.0 percent of their mean, repeat the tests.

S6.4 pH value. Determine the pH value of a brake fluid by running one sample according to the following procedure.

S6.4.1 Summary of the procedure. Brake fluid is diluted with an equal volume of an ethanolwater solution. The pH of the resultant mixture is measured with a prescribed pH meter assembly at 23°C (73.4°F).

S6.4.2 Apparatus. The pH assembly consists of the pH meter, glass electrode, and calomel electrode, as specified in Appendices A1.1, A1.2 and A1.3 of ASTM D1121–67, *Standard Method of Test for Reserve Alkalinity of Engine Antifreezes and Antirusts*. The glass electrode is a full range type (pH 0–14), with low sodium error.

S6.4.3 Reagents. Reagent grade chemicals conforming to the specifications of the Committee on Analytical Reagents of the American Chemical Society.

(a) *Distilled water*. Distilled water (S7.1) shall be boiled for about 15 minutes to remove carbon dioxide, and protected with a soda-lime tube or its equivalent while cooling and in storage. (Take precautions to prevent contamination by the materials used for protection against carbon dioxide.) The pH of the boiled distilled water shall be between 6.2 and 7.2 at 25°C (77°F).

(b) *Standard buffer soutions*. Prepare buffer solutions for calibrating the pH meter and electrode pair from salts sold specifically for use, either singly or in combination, as pH standards. Dry salts for 1 hour at 110°C (230°F) before use except for borax which shall be used as the decahydrate. Store solutions with pH less than 9.5 in bottles of chemically resistant glass or polyethylene. Store the alkaline phosphate solution in a glass bottle coated inside with paraffin. Do not use a standard with an age exceeding three months.

(1) Potassium hydrogen phthalate buffer solution (0.05 M, pH = 4.01 at 25°C (77°F)). Dissolve 10.21g of potassium hydrogen phthalate ($KHC_8H_4O_4$) in distilled water. Dilute to 1 liter.

(2) Neutral phosphate buffer solution (0.025 M with respect to each phosphate salt, pH = 6.86 at 25°C (77°F)). Dissolve 3.40g of potassium dihydrogen phosphate (KH_2PO_4) and 3.55g of anhydrous disodium hydrogen phosphate (NA_2HPO_4) in distilled water.

(3) Borax buffer solution (0.01 M, pH = 9.18 at 25°C (77°F)). Dissolve 3.81g of disodium tetraborate decahydrate ($Na_2B_40_7$ 10 H_2O) in distilled water, and dilute to 1 liter. Stopper the bottle except when actually in use.

(4) Alkaline phosphate buffer solution (0.01 M trisodium phosphate, pH = 11.72 at 25°C

(77°F)). Dissolve 1.42g of anhydrous disodium hydrogen phosphate (Na_2HPO_4) in 100 ml of a 0.1 M carbonate-free solution of sodium hydroxide. Dilute to 1 liter with distilled water.

(5) Potassium chloride electrolyte. Prepare a saturated solution of potassium chloride (KCl) in distilled water.

(c) *Ethanol-water mixture.* To 80 parts by volume of ethanol (S7.3) add 20 parts by volume of distilled water. Adjust the pH of the mixture to 7.0±0.1 using 0.1 N sodium hydroxide (NaOH) solution. If more than 4.0 ml of NaOH solution per liter of mixture is required for neutralization, discard the mixture.

S6.4.4 Preparation of electrode system.

(a) *Maintenance of electrodes.* Clean the glass electrode before using by immersing in cold chromic-acid cleaning solution. Drain the calomel electrode and fill with KCl electrolyte, keeping level above that of the mixture at all times. When not in use, immerse the lower halves of the electrodes in distilled water, and do not immerse in the mixture for any appreciable period of time between determinations.

(b) *Preparation of electrodes.* Condition new glass electrodes and those that have been stored dry as recommended by the manufacturer. Before and after using, wipe the glass electrode thoroughly with a clean cloth, or a soft absorbent tissue, and rinse with distilled water. Before each pH determination, soak the prepared electrode in distilled water for at least 2 minutes. Immediately before use, remove any excess water from the tips of the electrode.

S6.4.5 Standardization of the pH assembly and testing of the electrodes.

(a) Immediately before use, standardize the pH assembly with a standard buffer solution. Then use a second standard buffer solution to check the linearity of the response of the electrodes at different pH values, and to detect a faulty glass electrode or incorrect temperature compensation. The two buffer solutions bracket the anticipated pH value of the test brake fluid.

(b) Allow instrument to warm up, and adjust according to the manufacturer's instructions. Immerse the tips of the electrodes in a standard buffer solution and allow the temperature of the buffer solution and the electrodes to equalize. Set the temperature knob at the temperature of the buffer solution. Adjust the standardization or asymmetry potential control until the meter registers a scale reading, in pH units, equal to the known pH of the standardizing buffer solution.

(c) Rinse the electrodes with distilled water and remove excess water from the tips. Immerse the electrodes in a second standard buffer solution. The reading of the meter shall agree with the known pH of the second standard buffer solution within ±0.05 unit without changing the setting of the standardization of asymmetry potential control.

(d) A faulty electrode is indicated by failure to obtain a correct value for the pH of the second standard buffer solution after the meter has been standardized with the first.

S6.4.6 Procedure. To 50±1 ml of the test brake fluid add 50±1 ml of the ethanol-water (S6.4.3(c)) and mix thoroughly. Immerse the electrodes in the mixture. Allow the system to come to equilibrium, readjust the temperature compensation if necessary, and take the pH reading.

S6.5 Fluid stability. Evaluate the heat and chemical stability of a brake fluid by the following procedure, running duplicate samples for each test and averaging the results.

S6.5.1 Summary of the procedure. The degradation of the brake fluid at elevated temperature, alone or in a mixture with a reference fluid, is evaluated by determining the change in boiling point after a period of heating under reflux conditions.

S6.5.2 Apparatus. Use the apparatus and preparation specified in S6.1.2 and S6.1.3.

S6.5.3 High temperature stability.

S6.5.3.1 Procedure.

(a) Heat a new 60±1 ml sample of the brake fluid to 185±2°C (365±3.6°F). Hold at this temperature for 120±5 minutes. Bring to a reflux rate in excess of 1 drop per second within 5 minutes. The reflux rate should not exceed 5 drops per second at any time. Over the next 5±2 minutes adjust the heating rate to obtain an equilibrium reflux rate of 1 to 2 drops per second. Maintain this rate for an additional 2 minutes, taking 4 temperature readings at 30-second intervals. Average these as the observed ERBP. If no reflux is evident when the fluid temperature reaches 260° C (500°F), discontinue heating and report ERBP as in excess of 260°C (500°F).

S6.5.3.2 Calculation. Correct the observed ERBP for thermometer and barometric pressure factors according to S6.1.5(a) and (b). Average the corrected ERBP's of the duplicate samples. The difference between this average and the original ERBP obtained in S6.1 is the change in ERBP of the fluid.

S6.5.4 Chemical stability.

[S6.5.4.1 Materials.

(a) Except as provided in S6.5.4.1(b), SAE RM-66-03 *Compatibility Fluid,* as described in Appendix A of SAE Standard J1703, November 1983, *Motor Vehicle Brake Fluid,* November 1983.

(b) Until October 26, 1986, a manufacturer may use either SAE RM-66-03, or SAE RM-1 Compatibility Fluid as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970. See S6.

S6.5.4.2 Procedure.

(a) With *RM-66-03:* Except as provided in S6.5.4.2(b), mix 30±1 ml of the brake fluid with 30±1 ml of SAE RM-66-03 *Compatibility Fluid* in a boiling point flask (S6.1.2(a)). Determine the initial ERBP of the mixture by applying heat to the flask so that the fluid is refluxing in 10±2 minutes at a rate of excess of 1 drop per second, but not more than 5 drops per second. Note the maximum fluid temperature observed during the first minute after the fluid begins refluxing at a rate in excess of 1 drop per second. Over the next 15±1 minutes, adjust and maintain the reflux rate at 1 to 2 drops per second. Maintain this rate for an additional 2 minutes, recording the average value of four temperature readings taken at 30-second intervals as the final ERBP.

(b) With *RM-1:* Until October 26, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 *Compatibility Fluid* as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970. See S6.

(c) Thermometer and barometic corrections are not required. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

S6.5.4.3 Calculation. The difference between the initial ERBP and the final average temperature is the change in temperature of the refluxing mixture. Average the results of the duplicates to the nearest 0.5°C (1°F).

S6.6 Corrosion. Evaluate the corrosiveness of a brake fluid by running duplicate samples according to the following procedure.

S6.6.1 Summary of the procedure. Six specified metal corrosion test strips are polished, cleaned, and weighed, then assembled as described. Assembly is placed on a standard wheel cylinder cup in a corrosion test jar, immersed in the water-wet brake fluid, capped and placed in an oven at 100°C (212°F) for 120 hours. Upon removal and cooling, the strips, fluid, and cups are examined and tested.

S6.6.2 Equipment.

(a) *Balance.* An analytical balance having a minimum capacity of 50 grams and capable of weighing to the nearest 0.1 mg.

(b) *Desiccators.* Desiccators containing silica gel or other suitable desiccant.

(c) *Oven.* Gravity convection oven capable of maintaining the desired set point within 2°C (3.6°F).

(d) *Micrometer.* A machinist's micrometer 25 to 50 mm (1 to 2 inches) capacity, or an optical comparator, capable of measuring the diameter of the SBR wheel cylinder (WC) cups to the nearest 0.02 mm (0.001 inch).

S6.6.3 Materials.

(a) *Corrosion test strips.* Two sets of strips from each of the metals listed in Appendix C of SAE Standard J1703b. Each strip shall be approximately 8 cm long, 1.3 cm wide, not more than 0.6 cm thick, and have a surface area of 25±5 sq cm and a hole 4 to 5 mm (0.16 to 0.20 inch) in diameter on the centerline about 6 mm from one end. The hole shall be clean and free from burrs. Tinned iron strips shall be unused. Other strips, if used, shall not be employed if they cannot be polished to a high finish.

(b) *SBR cups.* Two unused standard SAE SBR wheel cylinder (WC) cups, as specified in S7.6.

(c) *Corrosion test jars and lids.* Two screw-top straight-sided round glass jars, each having a capacity of approximately 475 ml and inner dimensions of approximately 100 mm in height and 75 mm in diameter, and a tinned steel lid (no insert or organic coating) vented with a hole 0.8±0.1 mm (0.031±0.004 inch) in diameter (No. 68 drill).

(d) *Machine screws and nuts.* Clean, rust and oil-free, uncoated mild steel round or fillister head machine screws, size 6 or 8–32 UNC-Class 2A, ⅝ or ¾ inch long (or equivalent metric sizes), and matching uncoated nuts.

(e) *Supplies for polishing strips.* Waterproof silicon carbide paper, grit No. 320 A; grade 00 steel wool, lint-free polishing cloth.

(f) *Distilled water* as specified in S7.1.

(g) *Ethanol* as specified in S7.3.

(h) *Isopropanol* as specified in S7.7.

S6.6.4 Preparation.

(a) *Corrosion test strips.* Except for the tinned iron strips, abrade corrosion test strips on all surface areas with silicon carbide paper wet with ethanol (isopropanol when testing DOT 5 fluids) until all surface scratches, cuts and pits are removed. Use a new piece of paper for each different type of metal. Polish the strips with the 00 grade steel wool. Wash all strips, including the tinned iron and the assembly hardware, with ethanol; dry the strips and assembly hardware with a clean lint-free cloth or use filtered compressed air and place the strips and hardware in a desiccator containing silica gel or other suitable desiccant and maintained at 23±5°C (73.4±9°F), for at least one hour. Handle the strips with forceps after polishing. Weigh and record the weight of each strip to the nearest 0.1 mg. Assemble the strips on a clean dry machine screw, with matching plain nut, in the order of tinned iron, steel, aluminum, cast iron, brass, and copper. Bend the strips, other than the cast iron, so that there is a separation of 3±½ mm (⅛±1/64 inch) between adjacent strips for a distance of about 5 cm (2 inches) from the free end of the strips. (See Figure 4.) Tighten the screw on each test strip assembly so that the strips are in electrolytic contact, and can be lifted by either of the outer strips (tinned iron or copper) without any of the strips moving relative to the others when held horizontally. Immerse the strip assemblies in 90 percent ethyl alcohol. Dry with dried filtered compressed air, then desiccate at least one hour before use.

(b) *SBR WC cups.* Measure the base diameters of the 2 standard SBR cups, using an optical comparator or micrometer, to the nearest 0.02 mm (0.001 inch) along the centerline of the SAE and rubber-type identifications and at right angles to this centerline. Take the measurements at least 0.4 mm (0.015 inch) above the bottom edge and parallel to the base of the cup. Discard any cup if the two measured diameters differ by more than 0.08 mm (0.003 inch). Average the two readings on each cup. Determine the hardness of the cups according to S7.4.

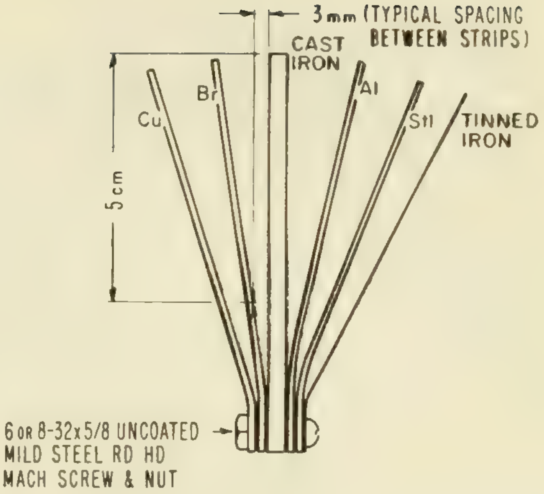

3mm (TYPICAL SPACING BETWEEN STRIPS)
CAST IRON
Br
Cu
Al
Stl
TINNED IRON
5cm
6 OR 8-32x5/8 UNCOATED MILD STEEL RD HD MACH SCREW & NUT

FIG. 4
CORROSION STRIP ASSEMBLY

S6.6.5 Procedure. Rinse the cups in ethanol (isopropanol when testing DOT 5 fluids) for not more than 30 seconds and wipe dry with a clean lint-free cloth. Place one cup with lip edge facing up in each jar. Insert a metal strip assembly inside each cup with the fastened end down and the free end extending upward. (See Figure 5.) When testing DOT 3 and DOT 4 brake fluids, mix 760 ml of brake fluid with 40 ml of distilled water, or, when testing DOT 5 brake fluids, humidify 800 ml of brake fluid in accordance with S6.2, eliminating determination of the ERBP; using this water-wet mixture, cover each strip assembly to a minimum depth of 10 mm above the tops of the strips. Tighten the lids and place the jars for 120±2 hours in an oven maintained at 100±2°C (212±3.6°F). Allow the jars to cool at 23±5°C (73.4±9°F) for 60 to 90 minutes. Impmediately remove the strips from the jars using forceps, agitating the strip assembly in the fluid to remove adhering sediment. Examine the test strips and jars for adhering crystalline deposits. Disassemble the metal strips, and remove adhering fluid by flushing with water; clean each strip by wiping with a clean cloth wetted with ethanol. Examine the strips for evidence of corrosion and pitting. Disregard staining or

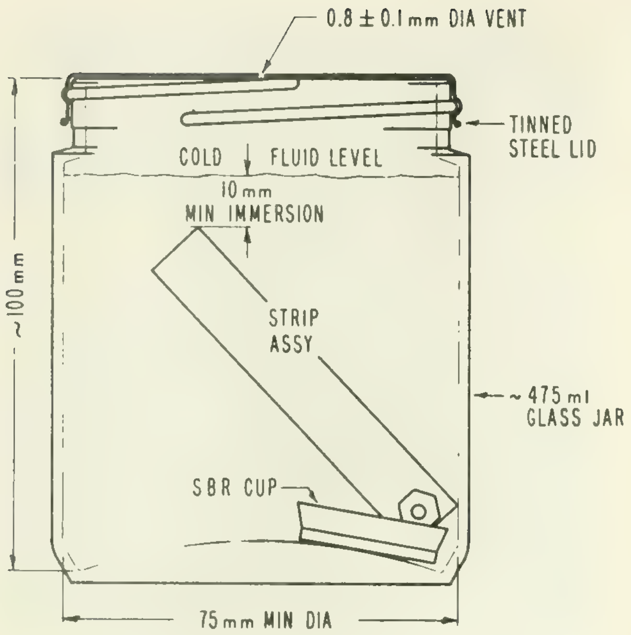


FIG. 5
CORROSION TEST APPARATUS

discoloration. Place the strips in a desiccator containing silica gel or other suitable desiccant, maintained at 23 ± 5°C (73.4 ± 9°F), for at least 1 hour. Weigh each strip to the nearest 0.1 mg. Determine the change in weight of each metal strip. Average the results for the two strips of each type of metal. Immediately following the cooling period, remove the cups from the jars with forceps. Remove loose adhering sediment by agitation of the cups in the mixture. Rinse the cups in ethanol and air-dry. Examine the cups for evidence of sloughing, blisters, and other forms of disintegration. Measure the base diameter and hardness of each cup within 15 minutes after removal from the mixture. Examine the mixture for gelling. Agitate the mixture to suspend and uniformly disperse sediment. From each jar, transfer a 100 ml portion of the mixture to an ASTM cone-shaped centrifuge tube. Determine the percent sediment after centrifuging as described in S7.5. Measure the pH value of the DOT 3 and DOT 4 test mixture according to S6.4.6.

S6.6.6 Calculation.

(a) Measure the area of each type of test strip to the nearest square centimeter. Divide the average change in weight for each type by the area of that type.

(b) Note other data and evaluations indicating compliance with S5.1.6. In the event of a marginal pass on inspection by attributes, or of a failure in one of the duplicates, run another set of duplicate samples. Both repeat samples shall meet all requirements of S5.1.6.

S6.7 Fluidity and appearance at low temperatures. Determine the fluidity and appearance of a sample of brake fluid at each of two selected temperatures by the following procedure.

S6.7.1 Summary of procedure. Brake fluid is chilled to expected minimum exposure temperatures and observed for clarity, gellation, sediment, separation of components, excessive viscosity or thixotropy.

S6.7.2 Apparatus.

(a) *Oil sample bottle.* Two clear flint glass 4-ounce bottles made especially for sampling oil and other liquids, with a capacity of approximately 125 ml, an outside diameter of 37.0 ± 0.05 mm and an overall height of 165 ± 2.5 mm.

(b) *Cold chamber.* An air bath cold chamber capable of maintaining storage temperatures down to minus 55°C (minus 67°F) with an accuracy of ± 2°C (3.6°F).

(c) *Timing device.* A timing device in accordance with S6.3.2(e).

S6.7.3 Procedure.

(a) Place 100 ± 1 ml of brake fluid at room temperature in an oil sample bottle. Stopper the bottle with an unused cork and place in the cold chamber at the higher storage temperature specified in Table II (S5.1.7(c)). After 144 ± 4 hours remove the bottle from the chamber, quickly wipe it with a clean, lint-free cloth, saturated with ethanol (isopropanol when testing DOT 5 fluids) or acetone. Examine the fluid for evidence of sludging, sedimentation, crystallization, or stratification. Invert the bottle and determine the number of seconds required for the air bubble to travel to the top of the fluid. Let sample warm to room temperature and examine.

(b) Repeat S6.7.3(a), substituting the lower cold chamber temperature specified in Table II, and a storage period of 6 hours ± 12 minutes. Note: Test specimens from either storage temperature may be used for the other only after warming up to room temperature.

S6.8 Evaporation. The evaporation residue, and pour point of the evaporation residue of brake fluid, are determined by the following procedure. Four replicate samples are run.

S6.8.1 Summary of the procedure. The volatile diluent portion of a brake fluid is evaporated in an oven at 100°C (212°F). The non-volatile lubricant portion (evaporation residue) is measured and examined for grittiness; the residues are then combined and checked to assure fluidity at minus 5°C (23°F).

S6.8.2 Apparatus.

(a) *Petri dishes.* Four covered glass petri dishes approximately 100 mm in diameter and 15 mm in height.

(b) *Oven.* A top-vented gravity-convection oven capable of maintaining a temperature of 100±2°C (212±3.6°F).

(c) *Balance.* A balance having a capacity of at least 100 grams, capable of weighing to the nearest 0.01 gram, and suitable for weighing the petri dishes.

(d) *Oil sample bottle.* A glass sample bottle as described in S6.7.2(a).

(e) *Cold chamber.* Air bath cold chamber capable of maintaining an oil sample bottle at minus 5±1° C (23±2° F).

(f) *Timing device.* A timing device as described in S6.3.2(e).

S6.8.3 Procedure. Obtain the tare weight of each of the four covered petri dishes to the nearest 0.01 gram. Place 25±1 ml of brake fluid in each dish, replace proper covers and reweigh. Determine the weight of each brake fluid test specimen by the difference. Place the four dishes, each inside its inverted cover, in the oven at 100±2°C (212±3.6°F) for 46±2 hours. (Note: Do not simultaneously heat more than one fluid in the same oven.) Remove the dishes from the oven, allow to cool to 23±5°C (73.4±9°F), and weigh. Return to the oven for an additional 24±2 hours. If at the end of 72±4 hours the average loss by evaporation is less than 60 percent, discontinue the evaporation procedure and proceed with examination of the residue. Otherwise, continue this procedure either until equilibrium is reached as evidenced by an incremental weight loss of less than 0.25 gram in 24 hours on all individual dishes or for a maximum of 7 days. During the heating and weighing operation, if it is necessary to remove the dishes from the oven for a period of longer than 1 hour, the dishes shall be stored in a desiccator as soon as cooled to room temperature. Calculate the percentage of fluid evaporated from each dish. Examine the residue in the dishes at the end of 1 hour at 23±5°C (73.4±9°F). Rub any sediment with the fingertip to determine grittiness or abrasiveness. Combine the residues from all four dishes in a 4-ounce oil sample bottle and store vertically in a cold chamber at minus 5±1°C (23±2°F) for 60±10 minutes. Quickly remove the bottle and place in the horizontal position. The residue must flow at least 5 mm (0.2 inch) along the tube within 5 seconds.

S6.8.4 Calculation. The average of the percentage evaporated from all four dishes is the loss by evaporation.

S6.9 Water tolerance. Evaluate the water tolerance characteristics of a brake fluid by running one test specimen according to the following procedure.

S6.9.1 Summary of the procedure. DOT 3 and DOT 4 brake fluid is diluted with 3.5 percent water, and DOT 5 brake fluid is humidified, then stored at minus 40°C (minus 40°F) for 120 hours. The cold, water-wet fluid is first examined for clarity, stratification, and sedimentation, then placed in an oven at 60°C (140°F) for 24 hours. On removal, it is again examined for stratification and the volume percent of sediment determined by centrifuging.

S6.9.2 Apparatus.

(a) *Centrifuge tube.* See S7.5.1(a).
(b) *Centrifuge.* See S7.5.1(b).
(c) *Cold chamber.* See S6.7.2(b).
(d) *Oven.* Gravity or forced convection oven.
(e) *Timing device.* See S6.3.2(e).

S6.9.3 Procedure.

(a) *At low temperature.* Humidify 100±1 ml of DOT 5 brake fluid in accordance with S6.2 eliminating determination of the ERBP. When testing DOT 3 and DOT 4 brake fluids, mix 3.5±0.1 ml. of distilled water with 100±1 ml of the brake fluid; pour into a centrifuge tube. Stopper the tube with a clean cork and place in the cold chamber maintained at minus 40±2°C (minus 40±3.6°F). After 120 ±2 hours remove the tube, quickly wipe with clean lint-free cloth saturated with ethanol or acetone and examine the fluid, for evidence of sludging, sedimentation, crystallization, or stratification. Invert the tube and determine the number of seconds required for the air bubble to travel to the top of the fluid. (The air bubble is considered to have reached the top of the fluid when the top of the bubble reaches the 2 ml graduation of the centrifuge tube.) If the wet fluid has become cloudy, warm to 23±5°C (73.4±9°F) and note appearance and fluidity.

(b) *At 60°C (140°F).* Place tube and brake fluid from S6.9.3(a) in an oven maintained at 60±2°C (140±2.6°F) for 24±2 hours. Remove the tube and immediately examine the contents for evidence of stratification. Determine the percent sediment by centrifuging as described in S7.5.

S6.10 Compatibility. The compatibility of a brake fluid with other brake fluids shall be evaluated by running one test sample according to the following procedure.

S6.10.1 Summary of the procedure.

(a) *With RM-66-03:* Except as provided in S6.10.1(b), brake fluid is mixed with an equal volume of SAE RM-66-03 *Compatibility Fluid,* then tested in the same way as for water tolerance (S6.9) except that the bubble flow time is not measured. This test is an indication of the compatibility of the test fluid with other motor vehicle brake fluids at both high and low temperatures.

(b) *With RM-1:* Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 *Compatibility Fluid* as described in Appendix A of SAE Standard J1703b,*Motor Vehicle Brake Fluid,* July 1970. See S6. This test is an indication of the compatibility of the test fluid with other motor vehicle brake fluids at both high and low temperatures.

S6.10.2 Apparatus and materials.

(a) *Centrifuge tube.* See S7.5.1(a).

(b) *Centrifuge.* See S7.5.1(b).

(c) *Cold chamber.* See S6.7.2(b).

(d) *Oven.* See S6.9.2(d).

(e) Except as provided in S6.10.2(f), *SAE RM-66-03 Compatibility Fluid.* As described in Appendix A of SAE Standard J1703, November 1983, *Motor Vehicle Brake Fluid,* November 1983.

(f) Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 *Compatibility Fluid* as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970. See S6.

S6.10.3 Procedure.

[(a) *At low temperature.*

(1) *With RM-66-03:* Except as provided in S6.10.3(a)(2), mix 50±0.5 ml of brake fluid with 50±0.5 ml of SAE RM-66-03 *Compatibility Fluid.* Pour this mixture into a centrifuge tube and stopper with a clean dry cork. Place tube in the cold chamber maintained at minus 40±2°C (minus 40±3.6°F). After 24±2 hours, remove tube, quickly wipe with a clean lint-free cloth saturated with ethanol (isopropanol when testing DOT 5 fluids) or acetone. Examine the test specimen for evidence of sludging, sedimentation, or crystallization. DOT 3 and DOT 4 test fluids shall also be examined for stratification.

(2) *With RM-1.* Until November 3, 1986, a manufacturer may use either RM-66-03, or SAE RM-1 *Compatibility Fluid* as described in Appendix A of SAE Standard J1703b, *Motor Vehicle Brake Fluid,* July 1970. See S6. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(b) *At 60°C (140°F).* Place tube and test fluid from S6.10.3(a) for 24±2 hours in an oven maintained at 60±2°C (140±3.6°F). Remove tube and immediately examine the contents of DOT 3 and DOT 4 test mixtures for evidence of stratification. Determine percent sediment by centrifuging as described in S7.5.

S6.11 Resistance to oxidation. The stability of a brake fluid under oxidative conditions shall be evaluated by running duplicate samples according to the following procedure.

S6.11.1 Summary of the procedure. DOT 3 and DOT 4 brake fluids are activated with a mixture of approximately 0.2 percent benzoyl peroxide and 5 percent water. DOT 5 brake fluid is humidified in accordance with S6.2 eliminating determination of the ERBP, and then approximately 0.2 percent benzoyl peroxide is added. A corrosion test strip assembly consisting of a cast iron and an aluminum strip separated by tinfoil squares at each end is then rested on a piece of SBR WC cup positioned so that the test strip is half immersed in the fluid, and ovenaged at 70°C (158°F) for 168 hours. At the end of this period the metal strips are examined for pitting, etching, and weight loss.

S6.11.2 Equipment.

(a) *Balance.* See S6.6.2(a).

(b) *Desiccators.* See S6.6.2(b).

(c) *Oven.* See S6.6.2(c).

(d) Three glass test tubes approximately 22 mm outside diameter by 175 mm in length.

S6.11.3 Reagents and materials.

(a) *Benzoyl peroxide, reagent grade, 96 percent.* (Benzoyl peroxide that is brownish, or dusty, or has less than 90 percent purity, must be discarded.) Reagent strength may be evaluated by ASTM E298–68, *Standard Methods for Assay of Organic Peroxides.*

(b) *Corrosion test strips.* Two sets of cast iron and aluminum metal test strips as described in Appendix C of SAE Standard J1703b.

(c) *Tinfoil.* Four unused pieces of tinfoil approximately 12 mm (½ inch) square and between 0.02 and 0.06 mm (0.0008 and 0.0024 inch) in thickness. The foil shall be at least 99.9 percent tin and contain not more than 0.024 percent lead.

(d) *SBR cups.* Two unused, approximately one-eight sections of a standard SAE SBR WC cup (as described in S7.6).

(e) *Machine screw and nut.* Two clean oilfree, No. 6 or 8–32 × ⅜ or ½ inch long (or equivalent metric size), round or fillister head, uncoated mild steel machine screws, with matching plain nuts.

S6.11.4 Preparation.

(a) *Corrosion test strips.* Prepare two sets of aluminum and cast iron tests strips according to S6.6.4(a) except for assembly. Weigh each strip to the nearest 0.1 mg and assemble a strip of each metal on a machine screw, separating the strips at each end with a piece of tinfoil. Tighten the nut enough to hold both pieces of foil firmly in place.

(b) *Test mixture.* Place 30±1 ml of the brake fluid under test in a 22 by 175 mm test tube. For DOT 3 and DOT 4 fluids, add 0.060±.002 gram of benzoyl peroxide, and 1.50±0.05 ml of distilled water. For DOT 5 fluids, use test fluid humidified in accordance with S6.2, and add only the benzoyl peroxide. Stopper the tube loosely with a clean dry cork, shake, and place in an oven for 2 hours at 70±2°C (158±3.6°F). Shake every 15 minutes to effect solution of the peroxide, but do not wet work. Remove the tube from the oven and allow to cool at 23±5°C (73.4±9°F). Begin testing according to paragraph S6.11.5 not later than 24 hours after removal of tube from oven.

S6.11.5 Procedure. Place a one-eighth SBR cup section in the bottom of each tube. Add 10 ml of prepared test mixture to each test tube. Place a metal-strip assembly in each, the end of the strip without the screw resting on the rubber, and the solution covering about one-half the length of the strips. Stopper the tubes with clean dry corks and store upright for 70±2 hours at 23±5°C (73.4±9°F). Loosen the corks and place the tubes for 168±2 hours in an oven maintained at 70±2°C (158±3.6°F). Afterwards remove and disassemble strips. Examine the strips and note any gum deposits. Wipe the strips with a clean cloth wet with ethanol (isopropanol when testing DOT 5 fluids) and note any pitting, etching or roughening of surface, disregarding stain or discoloration. Place the strips in a desiccator over silica gel or other suitable desiccant, at 23±5°C (73.4±9°F) for at least 1 hour. Again weigh each strip to the nearest 0.1 mg.

S6.11.6 Calculation. Determine corrosion loss by dividing the change in weight of each metal strip by the total surface area of each strip measured in square centimeters, to the nearest square centimeter. Average the results for the two strips of each type of metal, rounding to the nearest 0.05 mg per square centimeter. If only one of the duplicates fails for any reason, run a second set of duplicate samples. Both repeat samples shall meet all requirements of S5.1.11.

S6.12 Effect on SBR cups. The effects of a brake fluid in swelling, softening, and otherwise affecting standard SBR WC cups shall be evaluated by the following procedure.

S6.12.1 Summary of the procedure. Four standard SAE SBR WC cups are measured and their hardnesses determined. The cups, two to a jar, are immersed in the test brake fluid. One jar is heated for 70 hours at 70°C (158°F), and the other for 70 hours at 120°C (248°F). Afterwards, the cups are washed, examined for disintegration, remeasured, and their hardnesses redetermined.

S6.12.2 Equipment and supplies.

(a) *Oven.* See S6.6.2(c).

(b) *Glass jars and lids.* Two screw-top, straight-sided round glass jars, each having a capacity of approximately 250 ml and inner dimensions of approximately 125 mm in height and 50 mm in diameter, and a tinned steel lid (no insert or organic coating).

(c) *SBR cups.* See S7.6.

S6.12.3 Preparation. Measure the base diameters of the SBR cups as described in S6.6.4(b), and the hardness of each as described in S7.4.

S6.12.4 Procedure. Wash the cups in 90 percent ethanol (isopropanol when testing DOT 5 fluids) (see S7.3), for not longer than 30 seconds and quickly dry with a clean, lint-free cloth. Using forceps, place two cups into each of the two jars; add 75 ml of brake fluid to each jar and cap tightly. Place one jar in an oven held at 70° ± 2°C (158 ± 3.6°F) for 70 ± 2 hours. Place the other jar in an oven held at 120 ± 2°C (248 ± 3.6°F) for 70 ± 2 hours. Allow each jar to cool for 60 to 90 minutes at 23 ± 5°C (73.4 ± 9°F). Remove cups, wash with ethanol for not longer than 30 seconds, and quickly dry. Examine the cups for disintegration as evidenced by stickiness, blisters, or sloughing. Measure the base diameter and hardness of each cup within 15 minutes after removal from the fluid.

S6.12.5 Calculation.

(a) Calculate the change in base diameter for each cup. If the two values, at each temperature, do not differ by more than 0.10 mm (0.004 inch) average them to the nearest 0.02 mm (0.001 inch). If the two values differ by more than 0.10 mm, repeat the test at the appropriate temperature and average the four values as the change in base diameter.

(b) Calculate the change in hardness for each cup. The average of the two values for each pair is the change in hardness.

(c) Note disintegration as evidenced by stickiness, blisters, or sloughing.

S6.13 Stroking properties. Evaluate the lubricating properties, component compatibility, resistance to leakage, and related qualities of a brake fluid by running one sample according to the following procedures.

[**S6.13.1 Summary of the procedure.** Brake fluid is stroked under controlled conditions at an elevated temperature in a simulated motor vehicle hydraulic braking system consisting of three slave wheel cylinders and an actuating master cylinder connected by steel tubing. Referee standard parts are used. All parts are carefully cleaned, examined, and certain measurements made immediately prior to assembly for test. During the test, temperature, rate of pressure rise, maximum pressure, and rate of stroking are specified and controlled. The system is examined periodically during stroking to assure that excessive leakage of fluid is not occurring. Afterwards, the system is torn down. Metal parts and SBR cups are examined and remeasured. The brake fluid and any resultant sludge and debris are collected, examined, and tested.

S6.13.2 Apparatus and equipment.

Either the drum and shoe type of stroking apparatus (see Figure 1 of SAE Standard J1703b) except using only three sets of drum and shoe assemblies, or the stroking fixture type apparatus as shown in Figure 2 of SAE J1703, November 1983, with the components arranged as shown in Figure 1 of SAE J1703, November 1983. The following components are required.

(a) *Brake assemblies.* With the drum and shoe apparatus: three drum and shoe assembly units (SAE RM-29a) consisting of three forward brake shoes and three reverse brake shoes with linings and three front wheel brake drum assemblies with assembly component parts. With stroking fixture type apparatus: three fixture units including appropriate adapter mounting plates to hold brake wheel cylinder assemblies. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(b) *Braking pressure actuation mechanism.* An actuating mechanism for applying a force to the master cylinder pushrod without side thrust. The amount of force applied by the actuating mechanism shall be adjustable and capable of applying sufficient thrust to the master cylinder to create a pressure of at least 70 kg/sq cm (1,000 psi) in the simulated brake system. A hydraulic gauge or pressure recorder, having a range of at least 0 to 70 kg/sq cm (0 to 1,000 psi), shall be installed between the master cylinder and the brake assemblies and shall be provided with a shut-off valve and with a bleeding valve for removing air from the connecting tubing. The actuating mechanism shall be designed to permit adjustable stroking rates of approximately 1,000 strokes per hour. Use a mechanical or electrical counter to record the total number of strokes.

[(c) *Heated air bath cabinet.* An insulated cabinet or oven having sufficient capacity to house the three mounted brake assemblies or stroking fixture assemblies, master cylinder, and necessary connections. A thermostatically controlled heating system is required to maintain a temperature of 70 ± 5°C (158 ± 9°F) or 120 ± 5°C (248 ± 9°F). Heaters shall be shielded to prevent direct radiation to wheel or master cylinder. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(d) *Master cylinder (MC) assembly (SAE RM-15a).* One cast iron housing hydraulic brake system cylinder having a diameter of approximately 28 mm (1⅛ inch) and fitted for a filler cap and standpipe (see S6.13.2(e)). The MC piston shall be made from SAE CA360 copperbase alloy (half hard). A new MC assembly is required for each test.

(e) *Filler cap and standpipe.* MC filler cap provided with a glass or uncoated steel standpipe. Standpipe must provide adequate volume for thermal expansion, yet permit measurement and adjustment of the fluid level in the system to ±3 ml Cap and standpipe may be cleaned and reused.

[(f) *Wheel cylinder (WC) assemblies (SAE RM-14a).* Three unused cast iron housing straight bore hydraulic brake WC assemblies having diameters of approximately 28 mm (1⅛ inch) for each test. Pistons shall be made from unanodized SAE AA2024 aluminum alloy. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(g) *Micrometer.* Same as S6.6.2(d).

S6.13.3 Materials.

[(a) *Standard SBR brake cups.* Six standard SAE SBR wheel cylinder test cups, one primary test cup, and one secondary MC test cup, all as described in S7.6, for each test. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(b) *Steel tubing.* Double wall steel tubing meeting SAE specification J527. A complete replacement of tubing is essential when visual inspection indicates any corrosion or deposits on inner surface of tubing. Tubing from master cylinder to one wheel cylinder shall be replaced for each test (minimum length 3 feet). Uniformity in tubing size is required between master cylinder and wheel cylinder. The standard master cylinder has two outlets for tubing, both of which must be used.

S6.13.4 Preparation of test apparatus.

(a) *Wheel cylinder assemblies.* Use unused wheel cylinder assemblies. Disassemble cylinders and discard cups. Clean all metal parts with ethanol (ispropanol when testing DOT 5 fluids). Inspect the working surfaces of all metal parts for scoring, galling, or pitting and cylinder bore roughness, and discard all defective parts. Remove any stains on cylinder walls with crocus cloth and ethanol. If stains cannot be removed, discard the cylinder. Measure the internal diameter of each cylinder at a location approximately 19mm (0.75 inch) from each end of the cylinder bore, taking measurements in line with the hydraulic inlet opening and at right angles to this centerline. Discard the cylinder if any of these four readings exceeds the maximum or minimum limits of 28.66 to 28.60 mm (1.128 to 1.126 inches). Measure the outside diameter of each piston at two points approximately 90 degrees apart. Discard any piston if either reading exceeds the maximum or minimum limits of 28.55 to 28.52 mm (1.124 to 1.123 inches). Select parts to insure that the clearance between each piston and matching cylinder is within 0.08 to 0.13 mm (0.003 to 0.005 inch). Use unused SBR cups. To remove dirt and debris, rinse the cups in 90 percent ethyl alcohol for not more than 30 seconds and wipe dry with a clean lint-free cloth. Discard any cups showing defects such as cuts, molding flaws, or blisters. Measure the lip and base diameters of all cups with an optical comparator or micrometer to the nearest 0.02 mm (0.001 inch) along the centerline of the SAE and rubber-type indentifications and at right angles to this centerline. Determine base diameter measurements at least 0.4 mm (0.015 inch) above the bottom edge and parallel to the base of the cup. Discard any cup if the two measured lip or base diameters differ by more than 0.08 mm (0.003 inch). Average the lip and base diameters of each cup. Determine the hardness of all cups according to S7.4. Dip the rubber and metal parts of wheel cylinders, except housing and rubber boots, in the fluid to be tested and install them in accordance with the manufacturer's instructions. Manually stroke the cylinders to insure that they operate easily. Install cylinders in the simulated brake system.

(b) *Master cylinder assembly.* Use an unused master cylinder and unused standard SBR primary and secondary MC cups which have been inspected, measured and cleaned in the manner specified in S6.13.4(a), omitting hardness of the secondary MC cup. However, prior to determining the lip and base diameters of the secondary cup, dip the cup in test brake fluid, assemble on the MC piston, and maintain the assembly in a vertical position at 23±5°C (73.4±9°F) for at least 12 hours. Inspect the relief and supply ports of the master cylinder; discard the cylinder if ports have burrs or wire edges. Measure the internal diameter of the cylinder at two locations (approximately midway between the relief and supply ports and approximately 19 mm (0.75 inch) beyond the relief port toward the bottom or discharge end of the bore), taking measurements at each location on the vertical and horizontal centerline of the bore. Discard the cylinder if any reading exceeds the maximum or minimum limits of 28.65 to 28.57 mm (1.128 to 1.125 inches). Measure the outside diameter of each end of the master cylinder piston at two points approximately 90 degrees apart. Discard the piston if any of these four readings exceeds the maximum or minimum limits of 28.55 to 28.52 mm (1.124 to 1.123 inches). Dip the rubber and metal parts of the master cylinder, except the housing and push rod-boot assembly, in the brake fluid and install in accordance with manufacturer's instructions. Manually stroke the master cylinder to insure that it operates easily. Install the master cylinder in the simulated brake system.

[(c) *Assembly and adjustment of test apparatus.* When using a shoe and drum type apparatus, adjust the brake shoe toe clearances to 1.0 ± 0.1 mm (0.040 ± 0.004 inch). Fill the system with brake fluid, bleeding all wheel cylinders and the pressure gage to remove entrapped air. Operate the actuator manually to apply a pressure greater than the required operating pressure and inspect the system for leaks. Adjust the actuator and/or pressure relief valve to obtain a pressure of 70 ± 3.5 kg/sq cm (1,000 ± 50 psi). A smooth pressure-stroke pattern is required when using a shoe and drum type apparatus. The pressure is relatively low during the first part of the stroke and then builds up smoothly to the maximum stroking pressure at the end of the stroke, to permit the primary cup to pass the compensating hole at a relatively low pressure. Using stroking fixtures, adjust the actuator and/or pressure relief valve to obtain a pressure of 70 ± 3.5 kg/sq cm (1,000 ± 50 psi).

Adjust the stroking rate to 1,000 ± 100 strokes per hour. Record the fluid level in the master cylinder standpipe. **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

S6.13.5 Procedure. Operate the system for 16,000 ± 1,000 cycles at 23 ± 5°C (73.4 ± 9°F). Repair any leakage, readjust the brake shoe clearances, and add fluid to the master cylinder standpipe to bring to the level originally recorded, if necessary. Start the test again and raise the temperature of the cabinet within 6 ± 2 hours to 120 ± 5°C (248 ± 9°F). During the test observe operation of wheel cylinders for improper functioning and record the amount of fluid required to replenish any loss, at intervals of 24,000 strokes. Stop the test at the end of 85,000 total recorded strokes. These totals shall include the number of strokes during operation at 23 ± 5°C (73.4 ± 9°F) and the number of strokes required to bring the system to the operating temperature. Allow equipment to cool to room temperature. Examine the wheel cylinders for leakage. Stroke the assembly an additional 100 strokes, examine wheel cylinders for leakage and record volume loss of fluid. Within 16 hours after stopping the test, remove the master and wheel cylinders from the system, retaining the fluid in the cylinders by immediately capping or plugging the ports. Disassemble the cylinders, collecting the fluid from the master cylinder and wheel cylinders in a glass jar. When collecting the stroked fluid, remove all residue which has deposited on rubber and metal internal parts by rinsing and agitating such parts in the stroked fluid and using a soft brush to assure that all loose adhering sediment is collected. Clean SBR cups in ethanol (isopropanol when testing DOT 5 fluids) and dry. Inspect the cups for stickiness, scuffing, blistering, cracking, chipping, and change in shape from original appearance. Within 1 hour after disassembly, measure the lip and base diameters of each cylinder cup by the procedures specified in S6.13.4(a) and (b) with the exception that lip or base diameters of cups may now differ by more than 0.08 mm (0.003 inch). Determine the hardness of each cup according to S7.4. Note any sludge or gel present in the test fluid. Within 1 hour after draining the cylinders, agitate the fluid in a glass jar to suspend and uniformly disperse sediment and transfer a 100 ml portion of this fluid to a centrifuge tube and determine percent sediment as described in S7.5. Allow the tube and fluid to stand for 24 hours, recentrifuge and record any additional sediment recovered. Inspect cylinder parts, note any gumming or any pitting on pistons and cylinder walls. Disregard staining or discoloration. Rub any deposits adhering to cylinder walls with a clean soft cloth wetted with ethanol to determine abrasiveness and removability. Clean cylinder parts in ethanol and dry. Measure and record diameters of pistons and cylinders according to S6.13.4(a) and (b). Repeat the test if mechanical failure occurs that may affect the evaluation of the brake fluid.

S6.13.6 Calculation.

(a) Calculate the changes in diameters of cylinders and pistons (see S5.1.13 (b)).

[(b) Calculate the average decrease in hardness of the seven cups tested, as well as the individual values (see S5.1.13(c)).

(c) Calculate the increases in base diameters of the eight cups (see S5.1.13(e)). **(51 F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

(d) Calculate the lip diameter interference set for each of the [eight] cups by the following formula and average the [eight] values (see S5.1.13(f)).

$$\frac{D_1 - D_2}{D_1 - D_3} \times 100 = \text{percentage Lip Diameter Interference Set}$$

Where:

D_1 = Original lip diameter
D_2 = Final lip diameter
D_3 = Original cylinder bore diameter

S7. Auxiliary test methods and reagent standards.

S7.1 Distilled water. Non-referee reagent water as specified in ASTM D1193–70, "Standard Specifications for Reagent Water," or water of equal purity.

[**S7.2 Water content of motor vehicle brake fluids.** Use analytical methods based on ASTM D1123–59, *Standard Method of Test for Water in Concentrated Engine Antifreezes by the Iodine Reagent Method,* for determining the water content of brake fluids, or other methods of analysis yielding comparable results. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM-66-03 and TEGME *Compatibility Fluids* within ±15 percent of the water added for additions up to 0.8 percent by weight, and within ±5 percent of the water added for additions greater than 0.8 percent by weight. The SAE RM-66-03 *Compatibility Fluid* used to prepare the samples must have an original ERBP of not less than 205°C (401°F) when tested in accordance with S6.1. The SAE TEGME fluid used to prepare the samples must have an original ERBP of not less than 240°C (464°F) when tested in accordance with S6.1.

Until November 3, 1986, a manufacturer may use either RM–66–03 and TEGME or SAE RM–1 *Compatibility Fluid.* See S6. To be acceptable for use, such other method must measure the weight of water added to samples of the SAE RM–1 *Compatibility Fluid within* ±15 percent of the water added for additions up to 0.8 percent by weight, and within ±5 percent of the water added for additions greater than 0.8 percent by weight. The SAE RM–1 *Compatibility Fluid* used to prepare the samples must have an original ERBP of not less than 182°C. (360°F.) when tested in accordance with S6.1. **(5.1. F.R. 16699—May 6, 1986. Effective: May 6, 1986)]**

S7.3 Ethanol. 95 percent (190 proof) ethyl alcohol, USP or ACS, or Formula 3-A *Specially Denatured Alcohol* of the same concentration (see Part 212 of Title 26, *Code of Federal Regulations—U.S. Treasury Department,* I.R.S. Publication No. 368). For pre-test washings of equipment use approximately 90 percent ethyl alcohol, obtained by adding 5 parts of distilled water to 95 parts of ethanol.

S7.4 Measuring the hardness of SBR brake cups. Hardness measurements of SBR wheel cylinder cups and master cylinder primary cups shall be made by using the following apparatus and the following procedure.

S7.4.1 Apparatus.

(a) *Anvil.* A rubber anvil having a flat circular top 20±1 mm ($^{13}/_{16} \pm ^{1}/_{16}$ inch) in diameter, a thickness of at least 9 mm ($^{3}/_{8}$ inch) and a hardness within 5 IRHD,s of the SBR test cup.

(b) *Hardness tester.* A hardness tester meeting the requirements for the standard instrument as described in ASTM D1415–68, *Standard Method of Test for International Hardness of Vulcanized Natural and Synthetic Rubbers,* and graduated directly in IRHD units.

S7.4.2 Procedure. Make hardness measurements at 23±2°C (73.4±3.6°F). Equilibrate the tester and anvils at this temperature prior to use. Center brake cups lip side down on an anvil of appropriate hardness. Following the manufacturer's operating instructions for the hardness tester, make one measurement at each of four points one-fourth inch from the center of the cup and spaced 90 degrees apart. Average the four values, and round off to the nearest IRHD.

S7.5 Sediment by centrifuging. The amount of sediment in the test fluid shall be determined by the following procedure.

S7.5.1 Apparatus.

(a) *Centrifuge tube.* Cone-shaped centrifuge tubes conforming to the dimensions given in Figure 6, and made of thoroughly annealed glass. The graduations shall be numbered as shown in Figure 6, and shall be clear and distinct. Scale-error tolerances and smallest graduations between various calibrations made with air-free water at 20°C (68°F).

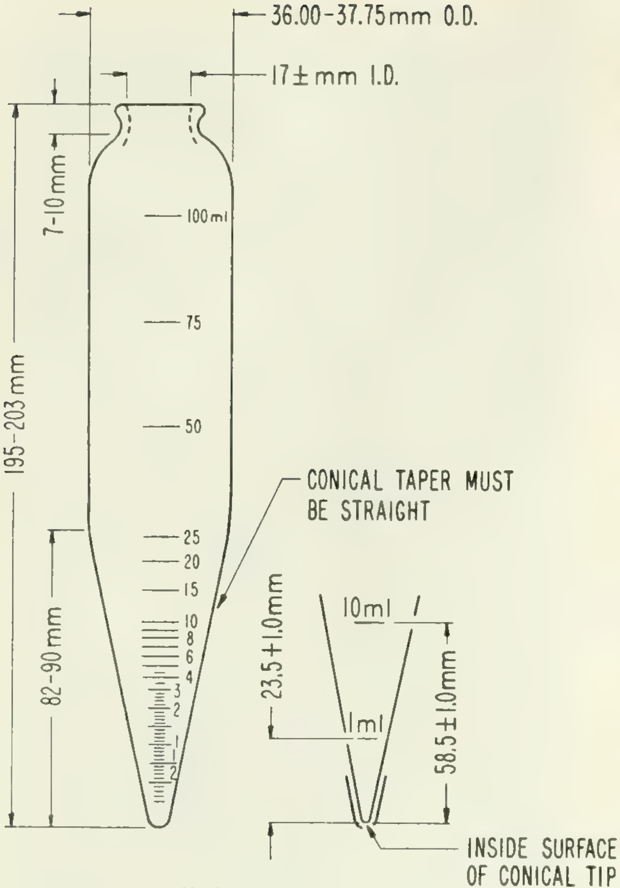


FIG. 6
ASTM 8-in CENTRIFUGE TUBE

TABLE V—Calibration Tolerances for 8-inch Centrifuge Tube

Range, ml	*Subdivision, ml*	*Volume Tolerance, ml*
0 to 0.1	0.05	±0.02
Above 0.1 to 0.3	0.05	±0.03
Above 0.3 to 0.5	0.05	±0.05
Above 0.5 to 1.0	0.10	±0.05
Above 1.0 to 2.0	0.10	±0.10
Above 2.0 to 3.0	0.20	±0.10
Above 3.0 to 5.0	0.5	±0.20
Above 5.0 to 10.0	1.0	±0.50
Above 10. to 25.	5.0	±1.00
Above 25. to 100.	25.	±1.00

(b) *Centrifuge.* A centrifuge capable of whirling two or more filled centrifuge tubes at a speed which can be controlled to give a relative centrifugal force (rcf) between 600 and 700 at the tip of the tubes. The revolving head, trunnion rings, and trunnion cups, including the rubber cushion, shall withstand the maximum centrifugal force capable of being delivered by the power source. The trunnion cups and cushions shall firmly support the tubes when the centrifuge is in motion. Calculate the speed of the rotating head using this equation:

$$\text{rpm} = 265\sqrt{\frac{\text{rcf}}{\text{d}}}$$

where: rcf = relative centrifugal force, and
d = diameter of swing, in inches, measured between tips of opposite tubes when in rotating position.

Table VI shows the relationship between diameter, swing, relative centrifugal force (rcf), and revolutions per minute.

S7.5.2 Procedure. Balance the corked centrifuge tubes with their respective trunnion caps in pairs by eight on a scale, according to the centrifuge manufacturer's instructions, and place them on opposite sides of the centrifuge head. Use a dummy assembly when one sample is tested. Then whirl them for 10 minutes, at a rate sufficient to produce a rcf between 600 and 700 at the tips of the whirling tubes. Repeat until the volume of sediment in each tube remains constant for three consecutive readings.

TABLE VI
Rotation Speeds for Centrifuges of Various Diameters

Diameter of swing, inches [a]	*Rpm at 600 rcf*	*Rpm at 700 rcf*
19	1490	1610
20	1450	1570
21	1420	1530
22	1390	1500

[a] Measured in inches between tips of opposite tubes when in rotating position.

S7.5.3 Calculation. Read the volume of the solid sediment at the bottom of the centrifuge tube and report the percent sediment by volume. Where replicate determinations are specified, report the average value.

S7.6 Standard styrene-butadiene rubber (SBR) brake cups. SBR brake cups for testing motor vehicle brake fluids shall be manufactured using the following formulation:

Formulation of Rubber Compound

Ingredient	*Parts by Weight*
SBR type 1503[a]	100
Oil furnace black (NBS 378)	40
Zinc oxide (NBS 370)	5
Sulfur (NBS 371)	0.25
Stearic Acid (NBS 372)	1
n-tertiary butyl-2-benzothiazole sulfanamide (NBS 384)	1
Symmetrical-dibetanaphthyl - p - phenylenediamine	1.5
Dicumyl peroxide (40 percent on precipitated $CaCO_3$)[b]	4.5
TOTAL	153.25

NOTE: The ingredients labeled (NBS_____) must have properties identical with those supplied by the National Bureau of Standards

[a] Philprene 1503 has been found suitable.

[b] Use only within 90 days of manufacture and store at temperature below 27°C (80°F).

Compounding, vulcanization, physical properties, size of the finished cups, and other details shall be as specified in Appendix B of SAE J1703b. The cups shall be used in testing brake fluids either within 6 months from date of manufacture when stored at room temperature below 30° (86°F) or within 36 months from date of manufacture when stored at temperatures below minus 15°C (+5°F). After removal of cups from refrigeration they shall be conditioned base down on a flat surface for at least 12 hours at room temperature in order to allow cups to reach their true configuration before measurement.

S7.7 Isopropanol. ACS or reagent grade.

36 F.R. 11987
June 24, 1971

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires—Passenger Cars

(Docket No. 1–8)

Proposals to amend § 571.21 of Title 49, "Federal Motor Vehicle Safety Standards," to add a new standard on retreaded tires for use on passenger cars, were published October 14, 1967 (32 F.R. 14280), and March 5, 1970 (35 F.R. 4136). Prior to the latter notice, on April 10, 1969, a technical conference was held at which a discussion paper was offered for comments. Based upon this prior rulemaking activity, and after considering those comments received, a new motor vehicle safety standard is hereby issued that requires manufacturers of retreaded tires for passenger cars to comply with specified requirements.

The standard requires retreaded pneumatic tires for passenger cars to meet requirements for bead unseating, strength, endurance, and high speed performance identical to those specified for new pneumatic passenger car tires in Motor Vehicle Safety Standard No. 109, and to meet physical dimension and labeling requirements similar to the requirements of Standard No. 109. Many comments received in response to the notice of proposed rulemaking raised objections to these requirements. One objection was that the requirements make the retreader responsible for the performance of the casing as well as for his own retreading process. The casing is, however, one of the raw materials used in the retreading process. As such, the responsibility for the soundness of the casing can lie only with the retreader, as it is he who will determine that the casing is suitable for retreading purposes.

Some comments objected to the requirements because they believed them to be inappropriate for the retreaded tires. Their position was that Standard No. 109, in specifying requirements for new tires, took into account that new tires are designed to be used for more than one tread life. Consequently, it is argued, it is unreasonable to subject a retreaded tire, whose casing has already undergone use through at least one tread life, to the same performance criteria as a new tire. The purpose of Standard No. 109, however, is to provide the public with passenger car tires that will perform safely under modern driving conditions. These conditions are the same whether a new tire or a retreaded tire is involved, and call for the same performance requirements, as far as is practicable. In agreement with this result is the position of certain parties who recommended that requirements for new and retreaded tires be identical. Their position was that retreaded tires must meet the same minimum performance requirements as new tires in order to prevent them from being considered as unsafe, or as less safe, than new tires.

Many comments particularly objected to the proposed requirement that retreaded tires must meet the same physical dimension requirements as new tires. It is recognized that tires may shrink during the retreading process. A dimensional requirement for retreaded tires is necessary, however, to ensure that retreaded tires labeled a certain size are within a specified maximum tolerance of the size. Consequently, as there may be difficulty in requiring retreaded tires to meet the same physical dimension requirements as new tires, the standard as issued requires that the section width and the overall width of retreaded tires not exceed by more than 10 percent the figure provided as the section width in Appendix A of Standard No. 109. This is a slight relaxation of the proposed requirement, which specified a 7-percent tolerance.

Several objections were also raised to the proposed requirements for tire casings. These proposals were that casings used in retreaded tires not have bead wire or cord fabric exposed either before or during the retreading process, that they not have a belt or ply removed during retreading, and that casings contain the labels on them by the original tire manufacturer pursuant to Standard No. 109. Many comments objected to the prohibition of retreading on casings having exposed cord fabric either before or during processing. The argument was presented that cord fabric exposed during the buffing part of the retreading process can be and often is repaired without affecting the service life or safety of the retreaded tire. As an alternative, some comments suggested that this requirement be changed to require that cord fabric not be "damaged." Once cord fabric has been exposed, however, it is far more likely to have been worn, exposed to moisture, or damaged in some other way. Furthermore, the suggested language would be nearly impossible to enforce, as any determination of "damage" would be largely subjective. Requiring that the fabric not be exposed, however, is a far less subjective test, and is consequently less subject to error. The proposed requirement has accordingly been retained.

Objections were also raised to the requirement that would prohibit the removal of a belt from a tire casing during processing. The argument presented was that belt removal, and the addition or replacement of a belt as well, should be allowed if the finished tire can meet the specified requirements. The agency has concluded, however, that belt removal, addition, and replacement raise questions concerning compatibility of materials and tire performance for which no data is presently available. Until such time as information is available on the effects on tire performance of belt removal, addition, or replacement, these practices will be prohibited in the manufacture of retreaded tires.

The proposed rule would have required retreaded tires to be labeled with the same information required on new pneumatic tires by Standard No. 109. The preamble to the notice indicated that this provision, requiring all original labeling to be on the casing and to be retained through the retreading process, would be accompanied by changes in the labeling requirements of Standard No. 109 that would require the original label to be placed in an area of the new tire sidewall where it would not be subject to destruction either during use or during retreading. As this amendment has not been made to Standard No. 109, the proposed labeling requirements are being modified. They require that each casing be one that has been labeled pursuant to S4.3 of Standard No. 109, but that the completed retreaded tire need only retain enough of the original label to display each item of required information in at least one location. The labeling requirements also provide that the retreaded tire be certified by labeling the tire with the symbol DOT, located on the tire as specified in Part 574, "Tire Identification and Record Keeping."

The notice of proposed rule making would have required retreaders to submit certain information to the agency, including a statement that records would be maintained by the retreader for a period of at least 3 years. These record keeping requirements involved records of materials used in the retreading process, records of process control, and records of performance tests and reported defects and failures. The purpose of these proposed requirements would have been to provide information to assist retreaders in ascertaining which tires might be suspect in the event of a finding of nonconformity or a safety-related defect. In consideration of comments received, the standard as now issued does not contain record keeping requirements, and record keeping by retreaders will be on a voluntary basis, consistently with the other standards. The NHTSA strongly recommends, however, that retreaders retain information on the materials and processes that they use, so that in the event of a defect or noncompliance they will be able to determine which tires are involved.

Similarly, the standard does not require retreaders to maintain records of performance tests or of reported defects and failures. Retreaders should be aware, however, that they are required to exercise due care in manufacturing retreaded tires to comply with this standard, and that information of this type is likely to be an important step in proving due care.

Effective date: January 1, 1972.

In consideration of the foregoing, § 571.21 of Title 49, Code of Federal Regulations, is amended by adding a new motor vehicle safety standard, No. 117, "Retreaded Pneumatic Tires: Passenger Cars" as set forth below.

Issued on April 14, 1971.

Douglas W. Toms,
Acting Administrator

36 F.R. 7315
April 17, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1-8)

This notice is issued in response to petitions for reconsideration received concerning Motor Vehicle Safety Standard No. 117, "Retreated Pneumatic Tires," 49 CFR § 571.21, published April 17, 1971 (36 F.R. 7315).

Timely petitions were received from 8 parties; Bandag Incorporated, National Tire Dealers and Retreaders Association (by the firm of Sellers, Conner & Cuneo), The Mississippi Independent Tire Dealers Association, Alabama Tire Dealers and Retreaders Association, and The Louisiana Independent Tire Dealers Association, Owens-Corning Fiberglas Corp., American Retreaders Association, the Goodyear Tire and Rubber Company, the Rubber Manufacturers Association, and the B.F. Goodrich Tire Company. Certain other petitions were received more than thirty days after publication of the standard, and while they are petitions for rulemaking under the agency's procedural rules (49 CFR § 553.35) they have been considered in the issuance of this notice.

1. *Availability of casings.* Paragraph S5.2.3 of the standard requires that each retreaded tire be manufactured with a casing that has been labeled pursuant to S4.3 of Motor Vehicle Safety Standard No. 109. In effect, only casings from tires manufactured on or after August 1, 1968, have been required to have this information permanently labeled on the tire. According to many petitions, the period between August 1, 1968 and January 1, 1972, the standard's effective date, has been too short to allow the accumulation of a sufficient supply of casings that bear the required labeling. Many petitioners therefore requested that casings labeled pursuant to Standard No. 109 not be required until 1974 or 1975. These requests are denied. However, in order to make additional casings available the standard has been amended to allow, between January 1, 1972 and January 1, 1974, the use of some casings labeled with specific fractional markings that were first introduced in 1965. These casings are those for use on wheels having diameters of 14 or 15 inches, marked with the size designations 6.45, 6.85, 6.95, 7.35, 7.75, 8.15, 8.25, 8.45, 8.55, 8.85, 8.90, 9.00, or 915, and labeled with certain information as a result of the "Tire Advertising and Labeling Guides" which were adopted by the Federal Trade Commission on July 5, 1966. In situations where these casings are used, the retreader is required to label them further, in a permanent manner, with a maximum load rating and maximum permissible inflation pressure obtained from a table incorporated into the standard. Casings that contain the specified information, together with the maximum load rating and maximum permissible inflation pressure added by retreaders, will be labeled with most of the information required on new tires by Standard No. 109, and in accordane with Section 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1421). Manufacturers who use these older casings should be aware, however, that retreaded tires manufactured with them must meet the same perormance requirements as tires manufactured with casings that have been certified tobe in compliance with Standard No. 109.

2. *Application of the DOT certification mark.* Paragraph S6 of the standard requires the manufacturer to certify each retreaded tire by affixing to the tire the symbol DOT, as provided in section 574.5 of the Tire Identification and Recordkeeping regulations. The Administration takes the position that affixing the DOT before the effective date of the standard is inconsistent with the intent of the National Traffic and Motor

Vehicle Safety Act, as it is only with respect to tires manufactured after the effective date that certification has legal significance. At the same time, under the Act all retreaded tires manufactured on or after January 1, 1972, must contain the DOT mark. Certain petitioners have indicated that it would be impossible, without a substantial disruption of business, for no tire to have a permanently affixed DOT symbol on or before December 31, 1971, and for all tires manufactured on January 1, 1972, and thereafter to have such a symbol. To remedy this problem the standard is being amended to allow the use of a paper label containing prescribed language to serve as a valid certification from January 1, 1972, through February 29, 1972.

3. *Retention of labeling.* Certain petitions requested that paragraph S6.2, which requires certain labeling on the casing to be retained, be amended because the labeling information sometimes appears in an area on the tire that is subject to buffing. Consequently, it is argued, it is imossible to retain the information through the retreading process. These requests are denied. The required labeling is essential to the appropriate use of the tire and varies from casing to casing. It has been determined that the most satisfactory way to ensure that correct information of this type appears on the completed tire is for the casing manufacturer's labeling to be retained. Casings that cannot be retreaded without destruction of the labeling will consequently be unsatisfactory for use.

4. *Casing with exposed cord.* Many petitioners objected to the requirements of paragraph S5.2.1 that prohibit the retreading of casings that have cord fabric exposed before or during processing. The argument preented is that such tires can be retreaded as effectively and will provide the same level of performance as tires manufactured from casings on which cord fabric is not exposed, as long as cords that are exposed are not damaged. These requests are denied.

The NHTSA recognizes that under optimum conditions, careful buffing that barely exposes, but does not touch, the tire cords can produce satisfactory results. In practice, however, tire buffing is often not done by precision methods or highly trained personnel, especially in the case of smaller tire retraders. Any buffing that damages or removes part of the tire cords reduces the strength of the carcass at that point. Thus, buffing to the cord materially increases the possibility of producing unsafe tires.

Furthermore, exposing tire cords in the retreading process can cause the retreaded tire to be unsafe even if the cord is not damaged. In the manufacture of new tires, the cords that eventually make up the carcass are passed through complex adhesive solutions of resin and latex, before being dried and coated with rubber. Exposed cords in buffed retread carcasses generally do not receive comparable treatment to bond them to the overlaid rubber. Also, exposed carcass cords that are not promptly covered can absorb moisture from the air, which substantially weakens them.

Since the exposure of belts in belted tires does not carry with it the danger of impairment of carcass strength as does the exposure of ply cords, the standard is amended to make it clear that exposure of belt material during processing is allowed. Belt material may not, however, as specified in S5.2.1, be removed, added, or replaced. The petitions in this regard are denied for the reasons specified in the preamble to the standard published April 17, 1971.

5. *Physical dimension tolerances.* Several petitions noted that although retreaded tires may shrink during the retreading process, the physical dimension requirements of S5.1.2 allow only for a 10% tolerance over the maximum width to allow for service growth. An amendment to allow some shrinkage was requested. It has been determined that a minus 3% deviation from the specified section width is justified, and the standard is amended accordingly.

Effective date: January 1, 1972.

In the light of the above, Federal Motor Vehicle Safety Standard No. 117 in § 571.21 of Title 49, Code of Federal Regulations, is hereby amended. . . .

Issued on October 22, 1971.

Douglas W. Toms
Administrator

36 F.R. 20877
October 30, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket 1–8; Notice 5)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires" to increase the number of allowable casings that may be retreaded, to allow ply cord to be exposed in a limited, specified manner during the retreading process, and to modify the labeling requirements. Motor Vehicle Safety Standard No. 117 was issued April 17, 1971 (36 F.R. 7315), and amended, in response to petitions for reconsideration, on October 30, 1971 (36 F.R. 20877). Since that time certain segments of the industry have requested additional changes to the standard. This amendment is based on those requests.

1. One major objection that was raised concerns the prohibition against exposing cord in the ply area of the tire during processing. The issuance of April 17, 1971, prohibited any tire from being retreaded on which cord had been exposed either before or during the retreading process. The standard was further amended in the issuance of October 30, to allow belt material, but not ply cords, to be exposed during the retreading process.

The prohibition against retreading a casing that has exposed cord is based primarily on the fact that cord that has been exposed may have been damaged, thereby weakening the casing and increasing the chance that the completed tire will be unsafe. This is especially true where cord is exposed during the life of the original tire, as exposure of cord in this case will generally have been caused by excessive wear. However, cord has heretofore been exposed during the buffing part of many retreading processes, as a method of determining whether a sufficient amount of old tread rubber has been removed before the application of the new tread. The NHTSA recognizes the importance of removing a sufficient amount of old tread, and that, as stated in the October 30 notice, "careful buffing that barely exposes, but does not touch, the tire cords can produce satisfactory results." The Administration retained the prohibition against buffing to the cord, except for belt material, on the basis of the finding that it could result in damage to the cord and create unsafe tires.

After reviewing additional information and arguments that have been presented by interested parties, the NHTSA has now determined that buffing to the ply cord in very limited circumstances can be allowed without incurring the risk that cords will be damaged during buffing. The amendment issued herewith allows buffing during the retreading process only at a splice, that is, where two segments of the same ply overlap. Exposure of cord at this point will not materially affect casing strength, as there still will be one layer of unexposed cord at the splice due to the ply overlap. Exposure of ply cord at a location other than a splice remains prohibited.

2. The standard as issued April 17, 1971, allowed only casings that had been labeled pursuant to Motor Vehicle Safety Standard No. 109 (49 CFR § 571.109) to be used in the manufacture of retreaded tires. The categories of casings that could be retreaded under the standard were expanded in the amendment of October 30, 1971. Certain other additions, namely, the inclusion of certain 13-inch and 15-inch tire sizes and series 70 tires, each of which must contain certain labeling, are incorporated by this amendment.

3. In the preamble to the amendment of October 30, 1971, the NHTSA denied requests to amend the requirement that the original labeling on casings be retained on the completed retreaded tire, and that casings without retainable

labeling be discarded. The NHTSA's position was that retention of the original labeling was the most satisfactory way to ensure that each retreaded tire would be labeled with the appropriate safety information, and it was recognized that some casings would have to be rejected because of this requirement. Information which the agency has recently received, however, indicates that this requirement may reduce the number of retreadable casings to a degree not anticipated. The shortage of casings will result because the labeling on many casings lies in an area where it would be removed during the retreading process. Although the problem had been described in comments at previous stages of rulemaking, specific data as to the number of available casings was presented to the agency after the October 30 amendment.

The agency has concluded after review of this data that to require the discarding of casings without retainable labeling could substantially impair the industry due to a shortage of casings. The NHTSA has accordingly decided to revoke these requirements of the standard and to propose an alternate labeling scheme. A notice of proposed rulemaking to that effect is published in this issue of the *Federal Register.* Much of the difficulty experienced by retreaders in finding casings that bear labeling not subject to destruction results from the fact that many new tires carry their required information in locations such that it is removed during the retreading process. The NHTSA is therefore issuing an additional notice of proposed rulemaking which would amend Standard No. 109 to require the labeling in question to be placed in an area where it will not be subject to destruction during the retreading process.

This amendment to Standard No. 117 does not change the requirement that only certain casings containing original labeling information be used in the manufacture of retreaded tires, but specifies that, at present, this labeling need not be retained on the completed tire.

In light of the above, section 571.117 of Title 49, Code of Federal Regulations (Motor Vehicle Safety Standard No. 117) is hereby amended. . . .

Effective date: January 1, 1972. The amendments issued herein relieve restrictions and impose no additional burdens on any person. Accordingly, it is found, for good cause shown, that an effective date less than 180 days, and less than 30 days, from the day of issuance is in the public interest.

This notice is issued pursuant to sections 103, 112, 113, 114, 119, and 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421) and the delegation of authority at 49 CFR 1.51.

Issued on December 21, 1971.

Douglas W. Toms
Administrator

36 F.R. 24814
December 23, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1–8; Notice 7)

The purpose of this notice is to reissue, with certain amendments, Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires." Standard No. 117 was published April 17, 1971 (36 F.R. 7315). In response to petitions for reconsideration, the standard was amended October 30, 1971 (36 F.R. 20877). As a result of additional evidence which was presented to the agency regarding the requirements for labeling of retreaded tires and other issues, the standard was amended again on December 23, 1971 (36 F.R. 24814). On the same day a notice of proposed rulemaking was also published proposing new labeling requirements (36 F.R. 24825). This notice is issued both in response to two petitions for reconsideration concerning the amendment of December 23, and to incorporate amendments based on the notice of proposed rulemaking of December 23.

The issues raised by the two petitions, one from the National Tire Dealers and Retreaders Association and the other from the Rubber Manufacturers Association, concern the availability of casings, casing labeling, and the physical dimension requirements of the standard. Requirements for labeling retreaded tires, which are related to the requirements for casing labeling, are dealt with below in the discussion of the amendments that are based on the notice of proposed rulemaking.

Availability of Casings. The petitions requested that additional casing sizes, namely 5.20, 6.40, 7.50, 8.00, 8.20, 8.50, 8.85, 9.50, 145, 155, 165, 175, 185, 195, and 205 be added to the list of usable casings. The request that sizes 5.20, 6.40, 7.50, 8.00, 8.20, 8.50, and 9.50 be added is denied. One purpose of Standard No. 117 is to limit usable casings to those manufactured within a limited period before the effective date of the standard. While these sizes were in fact manufactured during the period 1965–1967, unlike sizes presently allowed they were also manufactured in large numbers well before this period. It has not been demonstrated that these particular casing sizes are needed in order to ensure an adequate casing supply, and consequently they are not added to the list of usable casings. However, the remaining requested casing sizes, 8.85, 145, 155, 165, 175, 185, 195, and 205 are permitted to be used by this amendment as it appears that they were not in widespread use before the other sizes permitted to be used under the standard. In addition, the NHTSA has determined that some additional sizes, mostly radial sizes, may also be retreaded, and the proposed Table I has been amended accordingly and made part of the standard.

Casing labeling. As amended December 23, 1971, paragraph S5.2.4 of the standard required retreaded tires to be manufactured using casings that were either labeled in accordance with S4.3 of Standard No. 109, or until January 1, 1974, of certain enumerated sizes manufactured before the effective date of Standard 109. They were to be labeled with: (1) the generic name of the cord material used in the plies of the tire, (2) the actual number of plies, (3) the size of the tire, and (4) whether the tire is tubeless or tube type. The petitions have requested that casings not be required to contain this information.

The reason for requiring the casing, whether manufactured before or after the effective date of Standard 109, to contain the specified information is to provide information that retreaders can retain or carry over for the purpose of labeling retreaded tires. The only reliable source for much of this information is the casing.

The petitions have indicated, however, that not all of the information appears on many of the pre-Standard No. 109 casings, or appears in such a way that it cannot practicably be used for purposes of relabeling. The NHTSA has accordingly decided to modify the labeling requirements for pre-Standard No. 109 casings, and to make requirements for "DOT" casings consistent with them. As amended in this issuance, casings need only be labeled with (a) the tire's size designation, and (b) its actual number of plies or ply rating. Information obtained by NHTSA has indicated that almost all casing sizes allowed to be used by the standard had this information permanently labeled onto the tire sidewall.

The standard requires the casing to contain its original size marking. It also requires that the designated size of the retreaded tire be no larger (although it may be smaller) than the size of the original casing. Size is the chief criterion for consumers in the purchase of tires. The NHTSA has concluded that retreaded tires' sizes must be related to original casing markings in order to provide assurance that the correct size is placed on the retreaded tire, and that retreaders should not be allowed to determine casing size or the size of retreaded tires by any other means. Both petitions for reconsideration requested that this item of information not be required, and in this regard they are denied.

Casings are also required by this amendment to be labeled with either the tire's actual number of plies, or its ply rating. This modifies the proposed requirement that the "actual number of plies" appear. This information is also being required by today's amendment to appear on the retreaded tire. Ply rating is the basic criterion for determining the tire's maximum permissible inflation pressure and its maximum load. It is required to be on the casing because it cannot be determined with assurance except from the original tire marking. Some tires manufactured before the effective date of Standard No. 109 were not labeled with the actual number of plies, but of those that were not, almost all contained the ply rating. Consequently, requiring either actual number of plies or ply rating to be on casings will not reduce significantly the number of otherwise retreadable casings, and insofar as the petitions requested complete deletion of this requirement, they are denied.

The standard is amended as requested by the petitions to eliminate the requirement that the generic name of the cord material, and whether the tire is tubeless or tube-type, appear on the casing. It appears that industry practice before the effective date of Standard No. 109 varied in the manner that information of this type was labeled on new tires, and that requiring the information to be on the casing would unnecessarily restrict the types of usable casings.

Mention was made in the petitions of the possibility of information appearing on new tires being rubbed off in service, making casing labeling requirements difficult to meet. The NHTSA is of the opinion that, while this is a possible occurrence, complete obliteration of the labeling is unlikely. More important, however, is the fact that casings where the labeling does not appear should not, from a safety standpoint, be retreaded. The NHTSA has concluded that despite any consequent reduction in the number of casings, retreaders should not be left to their own devices in determining casing size and ply rating on completed tires, but that such information, for the safety of consumers, must be based on the casing's original markings.

Physical dimension requirements. The petitions have asked that the physical dimension requirements be amended to allow for a 3 percent minus deviation from the minimum size factor specified for the tire's size designation and type. The standard presently allows a plus 10 percent, and minus 3 percent deviation from the maximum section width only. The requests are based on the tendency of certain retreaded tires to shrink temporarily as a result of the retreading process.

These requests are denied. Data obtained from NHTSA tests indicate that the present requirements are being met, and that further relief is unnecessary. However, as a result of a comment received, paragraph S5.1.2 is being rewritten for purposes of clarity.

Labeling. The notice of proposed rulemaking published December 23, 1971 (36 F.R. 24825), specified a system by which retreaded tires would be required to be labeled with certain safety information. The use of an affixed label would be allowed for a limited period following the standard's effective date, but after that period the information would be required to be permanently molded into or onto the tire sidewall. The final rule issued today adopts this system, with certain modifications in the information to be provided, resulting from the amendments to paragraph S5.2.4. The information is the same for both affixed and molded labeling, and consists of (a) the tire's size designation, (b) its maximum permissible inflation pressure, (c) its maximum load, (d) the actual number of plies, ply rating, or both, (e) the words "tubeless" or "tube type" as applicable, (f) the words "bias/belted" if the tire is of bias-belted construction, and (g) the word "radial" if the tire is of radial construction.

Size, maximum load, and maximum permissible inflation pressure are required because each is necessary for proper selection and use of passenger car tires. While the standard requires the size to be based on the original casing size, the values for maximum load and inflation pressure may, where necessary, be based on a table incorporated into the standard. The values in the table are based on the values for the tire's size designation and type as they appear in Standard No. 109 (§ 571.109), and are determined according to the tire's size and ply rating, both of which are required to be on the casing.

The words "bias/belted" and "radial" are required, where appropriate, in order to identify tires of different types of construction. There is presently a large body of opinion, supported by NHTSA, that mixing tires of differing construction types on the same vehicle or same axle of a vehicle is not in the best interests of safety. In the case of the requirement that the words "bias/belted" appear, while not proposed in the notice of December 23, the information would have been available if the proposed language, "actual number of plies in the sidewall and the actual number of plies in the tread area, if different," had been retained. The NHTSA does not believe labeling the words "bias/belted" will present significant problems for retreaders as most belted tires were manufactured after the effective date of Standard No. 109, and are consequently identified as such. Those that were not usually contained some similar identification. Moreover, it appears that after proper buffing, belted tires exhibit visible differences from pure bias construction.

The word "radial" is also being required, despite the fact that as proposed it would not have been required until permanent markings were required. At the time of the proposal, however, NHTSA was not aware that radial tires were being retreaded. It appears now that they are, and in the interests of safety the term "radial" is required to be added to all retreaded radial tires.

The words "tubeless" or "tube type" are also required to be labeled onto completed retreaded tires. Almost all of the comments considered this information to be safety related. Even though not required to appear on the casing, the information will be available to retreaders, as (1) most tubeless casings were in fact so marked, and (2) a tube-type tire, in most cases, can be identified by the lack of inner lining that is present on tubeless tires. In those cases where identification is not possible, the casing should not be retreaded, as this information would likewise be unknown at time of sale.

The proposed requirement that the tire be labeled with the generic name of its cord material is not retained. The comments have argued, and NHTSA agrees, that in the case of retreaded tires this information is not substantially related to safety. This, combined with the fact that it appears only on certain casings, where it must if it is to be relabeled, has convinced the NHTSA that at present the requirement should not be included in the standard.

Many comments opposed the requirement that labeling be molded into or onto the tire sidewall until such a time as new tire labeling was required to be placed in a position where it would not be buffed off during retreading, and could thus be retained through the retreading process. These comments argued that permanent labeling of this type proposed was unreasonably difficult to apply to retreaded tires because tires that would require different labeling are retreaded in the same matrix. This would require constant, time consuming changing of the matrix, and a resultant high possibility of error.

Tires, however, may be subject to many applications during their useful life. They are transferred from wheel to wheel, and from vehicle to vehicle, and each time this takes place the information on the tire sidewall becomes important. Permanent labeling is therefore required if the information is to perform its function, as it can be readily assumed that affixed labels will last little longer than the first time the tire is mounted. Affixed labels, as indicated in the preamble to the proposed rule of December 23, are to be permitted only because methods for permanent labeling are not immediately available to retreaders, and not as a viable substitute for permanent labeling. The NHTSA disagrees with industry claims that permanent labeling presents unreasonable technical problems. Methods for permanent labeling developed for compliance with the Tire Identification and Recordkeeping Regulations (49 CFR Part 574) can be readily adapted to meet these requirements. In fact, of all the information required in today's amendment, only the "size" and "maximum load rating" will vary to a significant amount from casing to casing. Each of the other items of required information can be applied uniformly to large groups of casings and need not be changed from tire to tire if proper sorting is done before retreading occurs.

In light of the above, Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires," § 571.117 of Title 49, Code of Federal Regulations, is revised . . . .

Effective date: The standard's effective date of January 1, 1972, has been stayed as a result of court litigation, which is still pending. The NHTSA does not expect manufacturers to maintain a state of constant preparation so as to be able to comply with the standard as of the time the stay, should the court so decide, is lifted. It has determined, therefore, that additional leadtime will be necessary. Accordingly, the provisions of the standard, except those regarding labeling, shall become effective 30 days from the day the stay is lifted. The labeling requirements requiring the use of affixed labels shall become effective 90 days from that date, and those for permanent labeling, approximately one year from that date. Notice of exact dates will be published in the *Federal Register* at the time the stay is lifted.

This notice is issued pursuant to the authority of sections 103, 112, 113, 114, 119 and 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. §§ 1392, 1401, 1403, 1407, 1421); and the delegation of authority at 49 CFR 1.51.

Issued on March 17, 1972.

Douglas W. Toms
Administrator

37 F.R. 5950
March 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket 1–8; Notice 9)

This notice revokes high speed and endurance requirements in Motor Vehice Safety Standard No. 117, "Retreaded Pneumatic Tires," in accordance with an order of the United States Court of Appeals for the Seventh Circuit in *H & H Tire Company* v. *Volpe*, No. 71-1935, 7th Cir., December 5, 1972. It also specifies effective dates for provisions of the standard subject to a stay that was entered by the court on December 31, 1971, and removed by its order.

In a notice published March 23, 1972 (37 F.R. 9590), the NHTSA indicated that it did not believe retreaders should be required to maintain a state of constant preparation, so as to be able to conform to the standard immediately following the lifting of the stay by the reviewing court. The NHTSA took this position although the stay had been imposed only 24 hours before the standard was to become effective, and retreaders should have by that time taken all necessary steps to achieve compliance. The notice accordingly specified that those requirements of the standard dealing with matters other than labeling would become effective approximately 30 days after the stay imposed by the court had been lifted. Requirements dealing with affixed labels (S6.3.1) were to become effective in 90 days, and requirements for permanent labeling (S6.3.2) in one year.

When these dates were projected, however, the NHTSA had assumed a decision would be rendered by the court in a short time. That assumption proved incorrect, and the NHTSA has determined that more leadtime than that specified on March 23, 1972, should be allowed. This leadtime will allow retreaders to use up their already acquired inventory of casings, and to obtain labels to conform to the affixed labeling requirements.

This notice provides, therefore, that provisions of the standard except those dealing with permanent labeling are effective 120 days from the day of publication. The permanent labeling requirements of the standard are effective one year from the day of publication. The NHTSA is of the opinion that 120 days is sufficient under the circumstances for retreaders to take whatever remaining steps are necessary to achieve conformity with these requirements.

In light of the above, Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires", 49 CFR 571.117, is amended. . . .

Effective date: June 1, 1973, except for the provisions of paragraph S6.3.2, which are effective on February 1, 1974. The requirements of this standard were originally issued April 17, 1971, to become effective January 1, 1972. The standard in its present form was published March 23, 1972, but did not take effect due to a stay imposed on December 31, 1971. Accordingly, adequate lead time has already been provided for any long-range steps necessary for compliance. The public was notified of expected effective dates by the notice of March 23, 1972.

It is therefore found, for good cause shown, that an effective date less than 180 days from the date of publication of this notice is in the public interest.

(Sec. 103, 112, 113, 114, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51)

Issued on January 24, 1973.

Douglas W. Toms
Administrator

38 F.R. 2982
January 31, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 71–23; Notice 3)
(Docket No. 1–8; Notice 10)

This notice amends Motor Vehicle Safety Standards Nos. 109 and 117 (49 CFR 571.109) to reduce the minimum size of permanent safety labeling to 0.078 inches. Motor Vehicle Safety Standard No. 109, "New Pneumatic Tires," was amended November 4, 1972 (37 F.R. 23536), to specify both a location on the tire sidewall for safety labeling and a labeling size of not less than $3/32$ of an inch. Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires", was amended March 23, 1972 (37 F.R. 9590), to specify permanent labeling of the same minimum size.

The Michelin Tire Company has protested that the $3/32$ inch minimum size is inconsistent with the existing practice of European tire manufacturers of labeling tires in letters having a size of 0.078 inches (2mm). It has pointed out that as a consequence of the amendment, European tire manufacturers will have to increase the size of all existing labeling. The NHTSA has concluded that the difference between letters 0.078 inches in size and those of 0.093 inches is not significant, and does not justify the resultant expense to manufacturers of modifying tire molds. By this notice the NHTSA therefore reduces the minimum size to 0.078 inches for labeling required by S4.3 of Standard No. 109.

Because the permanent labeling provisions of Standard No. 117 are intended to be ultimately met with new tire labeling, the size requirements for permanent labeling in that standard are also modified.

In light of the above, Motor Vehicle Safety Standard No. 109, 49 CFR 571.109, and Motor Vehicle Safety Standard No. 117, 49 CFR 571.117, are amended . . . .

Effective dates: July 1, 1973, for the amendment to S4.3 of 49 CFR 571.109; February 1, 1974, for the amendment to S6.3.2 of 49 CFR 571.117. These amendments relieve an unnecessary restriction without a significant effect on motor vehicle safety. Consequently, it is found for good cause that notice and public procedure thereon are unnecessary, and that an effective date less than 180 days from the day of issuance is in the public interest.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegations of authority at 49 CFR 1.51.)

Issued on March 8, 1973.

James E. Wilson
Acting Administrator

38 F.R. 6999
March 15, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1–8; Notice 11)

This notice amends paragraph S6.2 of Standard No. 117, Retreaded Pneumatic Tires (49 CFR 571.117), to allow the temporary certification label permitted by that paragraph to be affixed to the sidewall of the tire, as well as to the tread. Federal Motor Vehicle Safety Standard No. 117 was published March 23, 1972 (37 F.R. 5950) and amended January 31, 1973 (38 F.R. 2982). Although the standard relating to the placement of a conformity label stated that the temporary label would be affixed "to the tread of the tire," the NHTSA did not intend to be restrictive of the label's location, and the limiting language was inadvertent.

Effective date: June 1, 1973. This amendment is corrective in nature and imposes no additional burden on any person. Accordingly, it is found that notice and public procedure thereon are unnecessary, and that good cause exists for an effective date less than 180 days from the day of publication.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51)

Issued on April 12, 1973.

James E. Wilson
Acting Administrator

38 F.R. 9668
April 19, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1-8; Notice 14)

On August 21, 1973 (38 F.R. 22493), the NHTSA proposed to amend 49 CFR § 571.117 (Motor Vehicle Safety Standard No. 117, "Retreaded Pneumatic Tires") to revise retreaded tire physical dimension requirements, to facilitate the labeling of bias/belted tires, to specify acceptable methods of permanent labeling, and to reduce labeling size. Interested persons were given the opportunity to submit comments by September 24, 1973. Only three comments were submitted within the comment period, none of which objected to the substance of the proposed amendments. Accordingly, the proposed revision of paragraphs S5.1.2, S6.3.1, and S6.3.2 of 49 CFR § 571.117 is adopted without change as set forth below.

Effective date: The amendments to S5.1.2 and S6.3.1 are effective January 9, 1974. The amendment to S6.3.2 is effective February 1, 1974. These amendments facilitate compliance with the standard, relieve restrictions, and do not reduce the level of safety established by the standard. Accordingly, good cause exists and is hereby found for an effective date less than 30 days from publication.

(Secs. 103, 112, 113, 114, 119, 201 Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegations of authority at 49 CFR 1.51.)

Issued on January 3, 1974.

James B. Gregory
Administrator

39 F.R. 1443
January 9, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1–8; Notice 15)

This notice and an accompanying notice of proposed rulemaking (39 F.R. 3571) are intended to implement the decision of the United States Court of Appeals for the District of Columbia in the *National Tire Dealers' and Retreaders' Association, Inc.*, v. *Brinegar* (Case No. 72–1753; decided January 8, 1974). Standard No. 117 was published in its present form on March 23, 1972 (37 F.R. 5950) and amended January 31, 1973 (38 F.R. 2982), March 15, 1973 (38 F.R. 6999), April 19, 1973 (38 F.R. 9668), May 3, 1973 (38 F.R. 10940), and January 9, 1974 (39 F.R. 1443).

Standard No. 117 would have required, effective February 1, 1974, that each retreaded tire be permanently labeled with each of the following items of information: the tire's size designation; the tire's maximum permissible inflation pressure, either as it appears on the casing or as set forth in Table 1 of the standard; the tire's maximum load, either as it appears on the casing or as set forth in Table 1; the actual number of plies, ply rating, or both; the word "tubeless", if the tire is a tubeless tire, or the words "tube-type" if the tire is a tube-type tire; the words "bias-belted", or the actual number of plies in the sidewall and the actual number of plies in the tread area, if the tire is of bias/belted construction; and the word "radial" if the tire is of radial construction. The Court's opinion vacates those parts of the permanent labeling requirements dealing with tire size, maximum inflation pressure, ply rating, tubeless or tube-type, and bias/belted and radial construction. It states that the standard should contain requirements for permanent labeling of the maximum permissible load, the actual number of plies, and the composition of the material used in the ply of the tire. This notice clarifies Standard No. 117 to require the maximum load to be permanently labeled onto each retreaded tire. As that requirement remains unchanged as a result of the Court's ruling, its effective date of February 1, 1974, is retained. Requirements for permanent labeling of the actual number of plies and the generic name of the cord material are not presently contained in the standard, and are accordingly proposed in a companion notice published on page 3571 of this issue of the Federal Register.

Under the language of Standard No. 117, the deletion of permanent labeling requirements results in a continuation of the existing requirement for affixed labeling in paragraph S6.3.1 with respect to the items of information deleted. Any information required to be labeled by paragraph S6.3.1 that is not permanently labeled onto the tire sidewall, i.e., either retained from the casing or relabeled on to the retreaded tire, must be included on a label, not easily removable, affixed to the tire sidewall.

In light of the above, paragraph S6.3.2 of 49 CFR 571.117 (Motor Vehicle Safety Standard No. 117) is revised. . . .

Effective date: February 1, 1974. This notice merely restates an effective date established January 31, 1973 (38 F.R. 2982).

(Sec. 103, 112, 113, 114, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on January 24, 1974.

James B. Gregory
Administrator

39 F.R. 3553
January 28, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1–8; Notice 17)

This notice amends Motor Vehicle Safety Standard No. 117, *Retreaded Pneumatic Tires*, to require additional permanent labeling for retreaded tires. A notice of proposed rulemaking regarding this amendment was published January 28, 1974 (39 F.R. 3571).

The permanent labeling required to be on each retreaded tire by this notice is the actual number of plies in the tire's sidewall and the actual number of plies in its tread area (if different), and the generic name of each cord material used in the plies (both sidewall and tread area) of the tire. These requirements are in addition to the existing requirement that each retreaded tire be permanently labeled with its maximum permissible load.

Under the rule as hereby amended, retreaders do not have to relabel the ply and cord material information if it is retained on the casing sidewall through the retreading process. If the information is removed during processing, however, it must be relabeled so that it will be permanently affixed to the completed tire. If the information does not appear on the casing before retreading the casing may not be retreaded unless the retreader can otherwise determine the correct information.

The requirements for the permanent labeling of these information items are based specifically on section 201 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1421). The NHTSA did not include them in earlier versions of the standard, as it had concluded that their relationship to safety was not sufficient to justify permanent relabeling. In its opinion in *NTDRA* v. *Brinegar* 409 F.2d 31 (D.C. Cir., 1974), however, the Court of Appeals stated that under the Safety Act the NHTSA was unauthorized to reach this conclusion, since Congress had determined that permanent labeling requirements for actual number of plies and cord material must be included in the standard. The proposal of January 28, 1974, was issued as a direct result of that opinion.

Many industry comments suggested that the NHTSA implement this aspect of the opinion by requiring the information to appear on completed retreaded tires only when the information was retained through the retreading process. In cases where the information could not be retained, one comment, from the National Tire Dealers and Retreader's Association (NTDRA), suggested the use of affixed paper or plastic labels to supply the information, so it could be available to the purchaser at the time of purchase. Most of the comments, however, suggested that when the information could not be retained, no requirement should be imposed. These comments argued that for the agency to require otherwise would present substantial burdens on retreaders because of the difficulties in labeling all of the possible combinations of ply and cord material. The industry comments further pointed out that the permanent labeling problem will eventually disappear because of the amendment to Standard No. 109, which requires all tires manufactured after July 1, 1973, to contain required labeling between the tire's maximum section width and bead. This labeling can be retained through the retreading process.

After careful consideration of the issues presented, the NHTSA has determined that it must issue the requirements in the form described. The agency is not unmindful that this will prevent the retreading of some casings otherwise usable, and will require relabeling of the information on others. The NHTSA believes that to issue the requirements in the form suggested by the industry comments would not be consistent with the requirements of Section 201 of the Safety Act as interpreted by the Court of Appeals in *NTDRA* v. *Brinegar*. To follow the industry suggestions would leave some tires without the information permanently labeled. It is impossible to reconcile this result with the statutory requirement as interpreted by the Court. Nor can the agency, in conformity with the statute, establish an effective date so far in the future as to provide sufficient time for tires not containing necessary labeling to enter the retreading process.

Based on its review of the record, the NHTSA does not find the requirement unreasonable or impracticable. Since the opinion in *NTDRA* v. *Brinegar*, methods have been developed which allow for the permanent labeling or relabeling of retreaded tires using a rubber medallion which is cured to the sidewall of the tire when the tire is in the mold. The comments indicate that this method is presently being used to permanently label not only a tire's maximum permissible load, as required, but its size, ply rating, and whether it is tubeless or tube type as well. The technology for this labeling approach has been fully documented in retreading journals, and in communications to the docket. The NHTSA has furnished opinions stating that the use of the medallion conforms to the standard's permanent labeling requirements. The docket contains clear information regarding the cost of medallion labeling. Each label costs the retreader some 2.5 cents, and the record demonstrates that the cost of both label and application should not exceed 10 cents per tire. This differs from representations previously made regarding permanent labeling costs, which had been represented at $2.50 per tire.

An additional problem raised in the comments is that adding the two information items greatly increases the labeling burden due to the number of possible combinations of information. The NHTSA does not believe the record supports this contention. According to NHTSA estimates, the variations in ply and cord material are relatively few in bias and bias-belted constructions, with only six possible combinations of ply and cord material in the case of bias tires and ten possible combinations in bias-belted construction. Together, these constructions would necessitate a maximum of 16 labels. While NHTSA estimates show a greater number of possible combinations in the case of radial tires, the record in this rulemaking suggests that few radial tires are as yet being retreaded. It appears most radials used for retreading will have been manufactured after July 1, 1973, and will have casings on which no relabeling would be needed.

Furthermore, one comment, which claimed an increase from 67 to 2,000 possible labels, presumed that all of the information (size, ply rating, maximum permissible inflation pressures, tubeless or tube type, as well as maximum permissible load, number of plies, and generic name of the cord materials) is placed on one label. However, there is nothing to prohibit the use of an additional label for both ply and cord material information, or even an additional label for each. Finally, relabeling is necessary only when the specified information is not retained through the retreading process. Estimates furnished by the industry and placed in the docket show that the information added by this amendment is not in a retainable position in only 1 out of 10 tires otherwise suitable for retreading. The requirement would presently affect a maximum of 10% of retreaded tires, and by the time of its effective date that percentage should decrease.

Prior to this amendment, Standard No. 117 required that on or after August 1, 1974, the only casings that could be used for retreading would be those that bore, originally molded into or onto their sidewalls, the symbol DOT, the tire size, and the actual number of plies or ply rating. The notice of proposed rulemaking of January 28, 1974, proposed to delete the ply-rating alternative, making it necessary to use only casings that show the actual number of plies. It also proposed to add a requirement that the casings to be used would be only those that had originally been labeled with the generic names of their cord materials. These casing requirements were proposed on the assumption that the casing should already contain this information if it is to appear on the completed retreaded tire.

Several comments objected to these proposed requirements on the basis that they would cause a reduction in the number of retreadable casings in certain older and hard-to-find sizes. The NHTSA finds merit in these arguments, and the proposed requirements, that casings used for retreading must be only those that are originally labeled with their actual number of plies and their cord materials, are not adopted. Retreaded tires as they are finally produced must contain this information. But unlike "size" and "ply rating," which are crucial for safety and should only be based on original casing labeling, the NHTSA has decided that retreaders should be free to otherwise obtain information on the number of plies and cord materials and then place it permanently on the tire.

One objection raised in the comments with respect to the requirement that all casings bear the symbol DOT erroneously assumed that these requirements are part of the proposal. The requirement that on or after August 1, 1974, only DOT casings be retreaded was issued March 23, 1972 (37 F.R. 5950), because of the agency's concern over the continued use of older casings which were not manufactured to meet Standard No. 109. It was based on industry comments that a 6-year supply of casings was required to meet industry needs. August 1, 1974, is 6 years from the date that all new tires were required to be labeled with the specified safety information which is the source of both affixed and permanent labeling under this standard.

The existing casing requirements therefore remain unchanged: the only casings that may be used for retreading are those that bear original permanent labeling of the DOT symbol, size, and the actual number of plies or ply rating.

In light of the above, section 571.117 of Title 49, Code of Federal Regulations (Motor Vehicle Safety Standard No. 117), is amended . . . .

Effective date: May 12, 1975.

(Secs. 103, 112, 113, 114, 119, 201; Pub. L. 89–563; 80 Stat. 718 (15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421); delegation of authority at 49 CFR 1.51.)

Issued on November 6, 1974.

James B. Gregory
Administrator

39 F.R. 39882
November 12, 1974

MOTOR VEHICLE SAFETY STANDARD NO. 117

Retreaded Pneumatic Tires

(Docket No. 1-8; Notice 7)

S1. Scope. This standard specifies performance, labeling, and certification requirements for retreaded pneumatic passenger car tires.

S2. Purpose. The purpose of this standard is to require retreaded pneumatic passenger car tires to meet safety criteria similar to those for new pneumatic passenger car tires.

S3. Application. This standard applies to retreaded pneumatic tires for use on passenger cars manufactured after 1948.

S4. Definitions.

S4.1 "Casing" means a used tire to which additional tread may be attached for the purpose of retreading.

"Retreaded" means manufactured by a process in which a tread is attached to a casing.

S4.2 All terms defined in § 571.109 and § 571.110 are used as defined therein.

S5. Requirements.

S5.1 Retreaded tires.

S5.1.1 Except as specified in S5.1.3, each retreaded tire, when mounted on a test rim of the width specified for the tire's size designation in Appendix A of § 571.109, shall comply with the following requirements of § 571.109:

(a) S4.1 (Size and construction).

(b) S4.2.1 (General).

(c) S4.2.2.3 (Tubeless tire resistance to bead unseating).

(d) S4.2.2.4 (Tire strength).

S5.1.2 Except as specified in S5.1.3, each retreaded tire, when mounted on a test rim of the width specified for the tire's size designation in Appendix A of § 571.109, shall comply with the requirements of S4.2.2.2 of § 571.109, except that the tire's section width shall not be more than 110 percent of the section width specified, and the tire's size factor shall be at least 97 percent of the size factor specified, in Appendix A of § 571.109 for the tire's size designation.

S5.1.3 Each retreaded tire shall be capable of meeting the requirements of S5.1.1 and S5.1.2 when mounted on any rim in accordance with those sections.

S5.1.4 No retreaded tire shall have a size designation, recommended maximum load rating, or maximum permissible inflation pressure that is greater than that originally specified on the casing pursuant to S4.3 of § 571.109, or specified for the casing in Table I.

S5.2 Casings.

S5.2.1 No retreaded tire shall be manufactured with a casing—

(a) On which bead wire or cord fabric is exposed before processing.

(b) On which any cord fabric is exposed during processing, except that cord fabric that is located at a splice, i.e., where two or more segments of the same ply overlap, or cord fabric that is part of the belt material, may be exposed but shall not be penetrated or removed to any extent whatsoever.

S5.2.2 No retreaded tire shall be manufactured with a casing—

(a) From which a belt or ply, or part thereof, is removed during processing; or

(b) On which a belt or ply, or part thereof, is added or replaced during processing.

S5.2.3 Each retreaded tire shall be manufactured with a casing that bears, permanently molded at the time of its original manufacture into or onto the tire sidewall, each of the following:

(a) The symbol DOT;

(b) The size of the tire; and

(c) The actual number of plies or ply rating

S5.2.4 [Reserved]

S6. Certification and labeling.

S6.1 Except as specified in S6.2, each manufacturer of a retreaded tire shall certify that his product complies with this standard, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act of 1966, by labeling the tire with the symbol DOT in the location specified in § 574.5 of this chapter.

S6.2 From June 1, 1973 to July 31, 1973, a manufacturer may certify compliance by affixing to the tread or sidewall of the tire, in such a manner that it is not easily removable, a label that states in letters not less than three thirty-seconds of an inch high:

This retreaded tire was manufactured after June 1, 1973 and conforms to all applicable Federal motor vehicle safety standards.

S6.3 Labeling.

S6.3.1 Each retreaded pneumatic tire manufactured on or after June 1, 1973, shall be labeled, in at least one location on the tire sidewall in letters and numerals not less than 0.078 inches high, with the following information:

(a) The tire's size designation;

(b) The tire's maximum permissible inflation pressure, either as it appears on the casing or as set forth in Table I;

(c) The tire's maximum load, either as it appears on the casing or as set forth in Table I;

(d) The actual number of plies, ply rating, or both;

(e) The word "tubeless" if the tire is a tubeless tire, or the words "tube type" if the tire is a tube-type tire;

(f) If the tire is of bias/belted construction, the words "bias/belted", or the actual number of plies in the sidewall and the actual number of plies in the tread area.

(g) The word "radial" if the tire is of radial construction.

The information shall either be retained from the casing used in the manufacture of the tire, or may be labeled into or onto the tire during the retreading process, either permanently (through molding, branding, or other method that will produce a permanent label) or by the addition of a label that is not easily removable.

S6.3.2 Each retreaded tire manufactured on or after May 12, 1975, shall bear permanent labeling (through molding, branding, or other method that will produce a permanent label, or through the retention of original casing labeling) in at least one location on the tire sidewall, in letters and numbers not less than 0.078 inches high, consisting of the following information:

(a) The tire's maximum permissible load,

(b) The actual number of plies in the tire sidewall, and the actual number of plies in the tire tread area, if different; and

(c) The generic name of each cord material used in the plies (both sidewall and tread area) of the tire.

TABLE I—PLIES

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
6.00–13	1010	32	1080	36	1140	40
6.50–13	1150	32	1230	36	1300	40
7.00–13	1270	32	1360	36	1440	40
6.45–14	1120	32	1200	36	1270	40
6.95–14	1230	32	1310	36	1390	40
7.35–14	1360	32	1450	36	1540	40
7.75–14	1500	32	1600	36	1690	40
8.25–14	1620	32	1730	36	1830	40
8.55–14	1770	32	1890	36	2000	40
8.85–14	1860	32	1990	36	2100	40
5.60–15	970	32	1040	36	1105	40
5.90–15	1050	32	1130	36	1200	40
6.85–15	1230	32	1320	36	1390	40
7.35–15	1390	32	1480	36	1570	40
7.75–15	1490	32	1590	36	1690	40
8.85–15	1610	32	1720	36	1820	40
8.25–15	1620	32	1730	36	1830	40
8.45–15	1740	32	1860	36	1970	40
8.55–15	1770	32	1890	36	2000	40
8.85–15	1860	32	1980	36	2100	40
9.00–15	1900	32	2030	36	2150	40
9.15–15	1970	32	2100	36	2230	40
8.90–15	2210	32	2360	36	2500	40

TABLE I—PLIES—Continued

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
A70–13	1060	32	1130	36	1200	40
D70–13	1320	32	1410	36	1490	40
D70–14	1320	32	1410	36	1490	40
E70–14	1400	32	1490	36	1580	40
F70–14	1500	32	1610	36	1700	40
G70–14	1620	32	1730	36	1830	40
H70–14	1770	32	1890	36	2010	40
J70–14	1860	32	1980	36	2100	40
L70–14	1970	32	2100	36	2230	40
C70–15	1230	32	1320	36	1390	40
D70–15	1320	32	1410	36	1490	40
E70–15	1400	32	1490	36	1580	40
F70–15	1500	32	1610	36	1700	40
G70–15	1620	32	1730	36	1830	40
H70–15	1770	32	1890	36	2010	40
J70–15	1860	32	1980	36	2100	40
K70–15	1900	32	2030	36	2150	40
L70–15	1970	32	2100	36	2230	40

TABLE I—PLIES—Continued

Tire Size	2 Ply—4 Ply (4 Ply Rating)		4 Ply (6 Ply Rating)		4 Ply (8 Ply Rating)	
	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure	Maximum Load	Maximum Inflation Pressure
165-13	1050	32	1130	36	1200	40
175-13	1150	32	1240	36	1350	40
185-13	1270	32	1390	36	1510	40
155R13	950	32	1015	36	1075	40
155R14	1010	32	1080	36	1140	40
155R15	1015	32	1085	36	1150	40
165R13	1010	32	1080	36	1140	40
165R14	1120	32	1200	36	1270	40
165R15	1130	32	1200	36	1270	40
175R14	1230	32	1310	36	1390	40
185R14	1360	32	1450	36	1540	40
185/70R13	1090	32	1140	36	1190	40
145-14*	865	32	905	36	935	40
145-15	895	32	940	36	975	40
195-15	1550	32	1680	36	1820	40
205-15	1700	32	1840	36	2000	40

* Dash Radial—Not an "R" Radial

36 F.R. 7315
April 17, 1971

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems for Passenger Cars and Multipurpose Passenger Vehicles

(Docket No. 69–11a)

In May 1968 the Director of the National Highway Safety Bureau issued a public advisory, stating that numerous cases of injury and death from accidental operation of power windows had been reported to the Bureau. He warned that many of those injuries and deaths had occurred because power windows could be closed when the ignition switch was off. In the advisory, the Director cautioned owners of vehicles with power-operated windows to have the wiring adjusted to prevent closure of the windows when the ignition switch is off.

It has been determined that the interests of motor vehicle safety require the imposition of a safety standard which will reduce, if not eliminate, the toll of deaths and injuries resulting from accidents involving power-operated windows.

A notice of proposed rule making relating to power-operated window systems in passenger cars and multipurpose passenger vehicles was published in the *Federal Register* on August 23, 1969 (34 F.R. 13608). Comments were requested concerning two objectives of the proposal: (1) To minimize the likelihood of personal injury or death occurring when a person is caught between a closing window and the frame, channel or seal, and (2) to insure that vehicle occupants can make emergency exits from vehicles equipped with power-operated windows in the event of a severe accident.

The comments received have been given careful consideration in the formulation of the safety standard issued today. To achieve the first major objective it was proposed that a power-operated window, once opened, not close when the ignition key of the vehicle is not in the "on" or "start" position. This proposal would have prohibited operation of windows when the key was in the "accessory" position, a position provided to avoid battery discharge and possible damage to the electrical system. The proposal would also have prohibited activation of power tailgate windows from the exterior of the vehicle. Several commenters objected that the proposal would in these respects prohibit widely accepted convenience features without corresponding safety benefits. These comments have been determined to have merit, and the standard as presently issued has been modified to require that a power-operated window system not be operative, except by muscular force or by operating an outside lock, when the key is removed from the ignition lock or is in an off position. This permits operation of windows with the key in the "accessory" position, as well as by a key-locking system on the exterior of the vehicle.

To achieve the second objective, it was proposed that a control be required that would open power-operated windows from inside the passenger compartment of the vehicle, regardless of the key position. Allowance of such a control, however, might tend to defeat the first major objective, and also make it easier for thieves to enter a locked vehicle. Further, an accident severe enough to jam a vehicle door very likely would be severe enough to jam the window in its channel or to interfere with the power source for emergency operation of the window. For these reasons this proposal has not been adopted in Standard No. 118. The standard does, however, permit installation of master control switches for overriding control of power-operated windows when the ignition key is in a position other than off.

Comments indicated an assumption that power-operated interior partitions were covered, as they were intended to be, though not specifically mentioned in the preamble of the proposal. To insure that there is no ambiguity on the point, Standard No. 118 includes partitions in the requirements.

The subject matter covered by this rulemaking action is being adopted at this time because it has been determined that it is feasible and that it can be implemented at an early date. The notice of proposed rule making upon which this rulemaking action is based was issued in conjunction with an advance notice of proposed rule making (34 F.R. 13609, Aug. 23, 1969) on power-operated window systems that dealt with the subject of mechanisms that would interrupt, stop, or reverse the direction of the window when a predetermined force is exerted on an object between the glazing and the frame, channel, or seal upon which it closes, and other fail-safe considerations. The advance notice involved engineering and economic problems of a substantial magnitude. Those problems and their solutions are undergoing further study and will be given consideration for rulemaking based on the results thereof.

In consideration of the foregoing, 49 CFR 571.21, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 118, Power-Operated Window Systems....

Effective date: February 1, 1971.

Issued on July 17, 1970.

Douglas W. Toms,
Director,
National Highway Safety Bureau

35 F.R. 11797
July 23, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

(Docket No. 74–1; Notice 3)

The purpose of this notice is to amend Standard No. 118, *Power-Operated Window Systems*, 49 CFR 571.118, to permit the operation of power windows under certain conditions when the ignition is not in the "on" position.

On September 23, 1974, the agency published a notice (39 F.R. 34062) proposing to allow the operation of power windows, when the key that controls the vehicle's engine is in the off position or is removed from the lock, only in circumstances where (1) only muscular force is used, or (2) a key-locking system on the vehicle's exterior is activated, or (3) a door that has no frame meeting the upper edge of the closed window is opened a specified amount and a switch separate from the normal power window switch is activated.

Nine comments were submitted to the docket, all of which approved of the basic proposal to allow operation of the power windows when the vehicle engine is not running. General Motors, who suggested the proposal as it was published, supported its adoption. However, most of the commenters objected to the proposed provision that a separate switch be required to operate a window when the door is open to a degree sufficient to permit a ball the size of a child's head to pass between the top edge of the fully closed window and the vehicle's roof rail. The objection was based on a contention that the separate switch provision was design restrictive and not necessary from a safety standpoint. According to the comments, required use of a separate switch for activation of the windows when the doors are opened would not assure a higher level of safety than use of the normal power activation switch.

The NHTSA finds merit in commenters arguments. It is the considered opinion of the agency that the absence of a separate switch requirement will have no effect on the safety of the power-operated window system since no switch would be capable of activation unless the vehicle's door were opened to the specified distance. For this reason the proposed separate switch requirement is deleted. Manufacturers will thus be free to install whatever type of activation system they wish, as long as the criteria of S3(c) are satisfied.

In addition, the description of the locations between which the test ball must fit appears to need clarification. It is the agency's intention that the ball be capable of passing between the upper rear corner of the fully closed window and the vehicle's roof rail. Therefore, the term "trailing edge" in S3(c) is changed to "upper rear corner."

In consideration of the foregoing, S3. of Standard No. 118, *Power-Operated Window Systems* (49 CFR 571.118) is amended. . . .

Effective date: Because this amendment relieves a restriction and imposes no additional burden on any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued: July 23, 1975.

James B. Gregory
Administrator

40 F.R. 31773
July 29, 1975

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

[Docket No. 82-07; Notice 2]

ACTION: Final Rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standard (FMVSS) No. 118, *Power-Operated Window Systems,* to permit the operation of a vehicle's power windows and partitions during the interval between the shutting off of the engine and the opening of a front door on the vehicle. This amendment, which was proposed in response to a petition from General Motors Corporation (GM), would permit the manufacturers to offer power window systems which are more convenient than current systems. The agency believes the amendment would increase design flexibility without adversely affecting safety.

DATES: This amendment is effective on May 5, 1983.

SUPPLEMENTARY INFORMATION: In 1970, NHTSA issued FMVSS 118 in response to numerous cases of injury and death resulting from accidental operation of power windows. The standard sought to address the main source of these accidents, the unsupervised use of power windows by children, which could result in the child being caught between the closing window or partition and the window or partition frame.

The standard provides that power-operated window and partition systems may be operable only in certain specified circumstances. First, operation is permitted when the vehicle's ignition switch is in the "ON," "START," or "ACCESSORY" position. The rationale for permitting operation in that situation is that the driver would presumably still be in the vehicle to supervise the operation of the windows by any children who are passengers. Second, the standard permits operation of the systems by "muscular force." Third, the systems may also be operated by a key-locking system on the exterior of the vehicle. Here again, the driver would presumably be able to observe the window or partition being closed to assure that the closing track is clear. Fourth, the standard permitted operation of the systems when the key is in the "off" position or removed from the vehicle and the door is opened a specified amount. This provision, which applies only to vehicles having doors with no frame meeting the upper edge of the closed window, was added to the standard in 1975 in response to a petition from GM. However, neither GM nor any other manufacturer ever produced the system which this provision was intended to permit, and it appears that no manufacturer plans to offer such a system in the future.

On April 1, 1982, in 47 FR 13845, the agency proposed to permit operation of power windows and partitions in a fifth circumstance, in response to another petition from GM. Under this proposal, these systems would be operable during the interval between the time the vehicle's ignition key is shut off to the time one of the vehicle's doors is opened. This provision would permit windows to be operable in situations such as refueling stops at service stations, an added convenience for the driver. However, it would also assure, except in rare circumstances that the driver is still in the vehicle and able to supervise the operation of the windows. The provision was proposed as a method of increasing driver convenience and was anticipated to have no impact on safety.

The agency received 28 comments on the proposal. Comments from the vehicle manufacturers favored the proposal, with some having proposals for slight refinements of the proposed regulatory language. Comments were also received from a number of individuals, most of whom opposed the amendment. After careful consideration of these comments, the agency has determined to promulgate the proposed amendment.

The individuals who opposed the proposed amendment generally argued that the change would permit the operation of power windows by unsupervised children and therefore would be a detriment to safety. Based on the agency's review of the comments and conversations with several of these individuals, it appears that they were unaware that the window systems would cease being operational as soon as the engine is shut off and a door is opened and would remain nonoperational even if the door were again closed. Thus, the proposal would tend to assure that the driver is in the car when the windows can move. Once this aspect of the proposal was explained to the individuals, they no longer opposed the amendment.

While there is a possibility under the new option for power windows to be operational without the driver being present in the vehicle, that possibility could arise only in rare circumstances. Further, similar possibilities exist under one of the existing options. For example, under the new option, a driver could get out of a vehicle, leaving the engine running and close the door. The windows would still be operational. Then, if the driver's window were open so that he or she could reach through the open window instead of opening the door to shut the engine off, the windows would continue to be operational. Similarly, under one of the current options, power windows would be operable in the same circumstances, at least until the driver reached into the vehicle and shut of the engine. The agency believes that these circumstances would rarely occur and would be even less likely to occur when children were in the car. Accordingly, the agency believes that this potential detriment would, if it occurs at all, be very small. Even if it does occur, it could be offset by a small benefit suggested by other commenters. They felt that the amendment would provide a security advantage, by permitting drivers to quickly close the vehicle's windows for protection without first having to turn on the ignition switch. Overall, the agency does not anticipate that the proposal would result in any increase in injuries or deaths.

Several manufacturers argued for certain modifications to the proposed rule. Mercedes-Benz argued that the interval after engine shut-off during which the windows are operable should end when one of the *front* doors is opened. American Motors made a similar suggestion. The agency agrees that, in the case of four door automobiles, it is unlikely that the driver would exit from one of the rear doors and entry to or exit from rear seats should not impede the ability of the driver to supervise children in the vehicle. Therefore, the agency has adopted this suggestion.

Fiat Motors suggested that the agency permit the use of systems incorporating a 20 second time delay, i.e., windows would be operable for 20 seconds after the engine is shut off regardless of whether a door had been opened. Such a system could provide a brief interval during which children in a vehicle would be unsupervised and the power window system would be operational, possibly increasing the risk of the types of accidents FMVSS 118 was designed to prevent. The agency believes, on the basis of current information, that adoption of the proposal is not appropriate. If Fiat or any other commenter wishes to present data or arguments with regard to the safety impacts of such a system, the agency will reconsider permitting the use of this type of system.

American Motors Corporation (AM) also suggested several clarifications to the proposed rule. First, AM suggested that the rule explicitly state that power window and partition systems may be operable when the ignition switch is in the "ACCESSORY" position after a door is opened. Since the standard always permitted systems to be operable whenever the ignition key is in the "ACCESSORY" position, no substantive change would be involved. The agency has attempted to clarify this point. AM further suggested that references in the standard to the "key that controls activation of the vehicle's engine" be replaced by "ignition switch." However, the standard would apply to any systems used in electric vehicles or other motor vehicles which operate by energy produced by means other than ignition. Therefore, the latter suggestion has not been adopted.

AM also favored the deletion of the provision permitting the operation of power windows in certain vehicles when a door is opened a specified amount, since that provision never has and likely never would be used. Since this provision is apparently obsolete, it has been deleted.

The agency is making this amendment effective immediately upon publication, since the amendment "relieves a restriction" within the meaning of 5 U.S.C. 553(d)(1), by permitting the use of certain systems which were previously unauthorized. The agency also finds that making this amendment effective immediately is in the public interest, in accordance with section 103(e) of the National Traffic and Motor Vehicle Safety Act, since doing so will permit the use of more convenient power window systems at an early date. Also, since the amendment relieves a restriction in FMVSS 118, providing 180 days lead time is unnecessary.

NHTSA has determined that this proceeding does not involve a "major rule" within the meaning of section 1, paragraph (b), of Executive Order 12291 because it is not likely to have an effect on the economy of $100 million or more, to result in a major increase in costs or prices, or to have a significant adverse effect on competition, employment, investment, productivity, innovation, or the ability of United States firms to meet foreign competition. Similarly, this action is not deemed "significant" for purposes of Department of Transportation procedures for internal review of regulatory actions. The economic impacts of this Amendment are so minimal as to not warrant preparation of a full regulatory evaluation, since the amendment merely permits the use of certain systems which were previously prohibited.

Pursuant to the Regulatory Flexibility Act, the agency has considered the impact of this rulemaking action on small entities. I certify that this action will not have a significant economic impact on a substantial number of small entities, including small organizations or governmental units. Therefore, a regulatory flexibility analysis is not required for this action. The agency has concluded that few, if any, manufacturers of power window systems are small entities and that the impacts of this rule on those companies which decide to take advantage of the new alternative method of compliance should be minimal. There would be no significant impact on the cost of new vehicles manufactured in accordance with the new provision. Therefore, there should be no significant impact on small entities which purchase vehicles with power windows.

In consideration of the foregoing, 49 § 571.118 is amended as follows:

1. Section 3 is revised to read as follows:

S3. Power window or partition systems may be operable only in the following circumstances.

(a) When the key that controls activation of the vehicle's engine is in the "ON", "START", or "ACCESSORY" position;

(b) By muscular force unassisted by a vehicle power source;

(c) Upon activation by a key-locking system on the exterior of the vehicle; or

(d) During the interval between the time a running engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors.

Issued on April 29, 1983

Raymond A. Peck, Jr.,
Administrator

48 F.R. 20237
May 5, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

[Docket No. 82-07; Notice 3]

ACTION: Final rule, response to petition for reconsideration.

SUMMARY: This notice responds to a petition for reconsideration filed by General Motors Corporation with regard to the agency's recently issued rule amending Federal Motor Vehicle Safety Standard (FMVSS) No. 118, *Power-Operated Window Systems.* GM requested that the agency clarify the language of this amendment, which permits operation of power windows during the interval between the shutting off of a vehicle engine and the opening of a door. NHTSA agrees that the clarification suggested by GM is consistent with the agency's intent in originally amending the standard, and the agency is therefore further amending the standard accordingly.

EFFECTIVE DATE: October 14, 1983.

SUPPLEMENTARY INFORMATION: On May 5, 1983, NHTSA published a final rule amending FMVSS 118 (49 CFR 571.118), in response to a rulemaking petition filed by General Motors Corporation. The GM petition requested that the standard be amended to permit operation of power windows during the interval between the shutting off of a "running engine" and the opening of the vehicle's front doors. GM sought this amendment to permit it to offer power window systems which GM believes are more convenient to use. Prior to this amendment, vehicles had to be designed so that a driver who shut his or her vehicle's engine off but remained in the vehicle would have to turn the vehicle ignition back to the "ON" or "ACCESSORY" position in order to operate the windows.

FMVSS 118 was originally issued to prevent injuries resulting from automative power windows closing on small children. Prior to the issuance of that standard, such injuries most often occurred when children operated the windows without the driver present. The standard seeks to minimize the likelihood of this unsupervised operation of the windows by requiring that operation of the windows be controlled by a key, typically the ignition key. This requirement assures, in most instances, that the driver is present in the vehicle when power windows are operable.

The GM petition was found by the agency to be consistent with this concept of positive key control of power window operation. Between the time a running engine is shut off and the opening of a front door, the driver of the vehicle would in all likelihood still be in the vehicle and able to assure that children in the vehicle were not playing with the windows. Therefore, the agency granted the GM rulemaking petition and amended FMVSS 118 to permit window operation during that time interval. See 48 FR 20237, May 5, 1983.

On June 3, 1983, GM requested that the agency clarify the langauge adopted in the May 5th amendment, either by issuing an interpretation concerning the specified language or by amending the language. The problem pointed out by GM is that most power window systems do not actually sense whether an engine is running. Instead, they sense the position of the ignition locking device, which usually correlates very closely with the operation or nonoperation of the engine. Thus, for example, in a system designed to comply with the amended standard by sensing the key position, if the ignition key were turned to the "ON" position and then the "OFF" position, the power windows would remain operable until a front door opened. However, strictly speaking, this hypothetical situation might not involve turning off a "running engine" (for example, when the engine stalls). Therefore, such a system could be considered in violation of the standard.

The agency agrees with GM that there is no significant safety-related difference between window systems which sense key position and those which sense engine operation. The important consideration from the agency's perspective is the assurance that the driver is likely to be present in the vehicle to supervise operation of the power windows. These two possible system designs appear to provide equal assurance that the driver is present. Requiring that the power window system sense engine operation in addition to key position would, on the other hand, add substantially to the cost of such systems. Therefore, NHTSA is herein amending FMVSS 118 to clarify the time interval during which power window operation is permissible, consistent with the GM request. This action is being taken in the form of an amendment to the standard rather than as an interpretation, to provide the clearest public notice of the requirements of FMVSS 118. This amendment is consistent with the original intent of the May 5th amendment.

The agency is making this amendment effective immediately upon publication since the amendment merely clarifies an existing provision of FMVSS 118. The agency finds that making this amendment effective immediately is in the public interest in accordance with Section 103(e) of the National Traffic and Motor Vehicle Safety Act, because the amendment will facilitate the use of more convenient power window systems at an early date. Also, since the amendment does not add any substantive requirements to FMVSS 118, providing 180 days lead time is unnecessary.

NHTSA has determined that this proceeding does not qualify as a "major rule" within the meaning of section 1, paragraph (b), of Executive Order 12291 because it is not likely to have an effect on the economy of $100 million or more, to result in a major increase in costs or prices, or to have a signficant adverse effect on competition, employment, investment, productivity, innovation, or the ability of the United States firms to meet foreign competition. Similarly, this action is not deemed "significant" for purposes of Department of Transportation procedures for internal review of regulatory actions. The economic impacts of this amendment are so minimal as to not warrant preparation of a full regulatory evaluation, since the amendment merely clarifies regulatory language permitting the use of certain systems which were prohibited prior to May 5, 1983.

Pursuant prior to the Regulatory Flexibility Act, the agency has considered the impact of this rulemaking action on small entities. I certify that this action will not have a significant economic impact on a substantial number of small entities, including small organizations or governmental units. Therefore, a regulatory flexibility analysis is not required for this action. The agency has concluded that few, if any, manufacturers of power window systems are small entities, and that the impacts of this rule on any manufacturer should be minimal. There would be no significant impact on the cost of new vehicles manufactured in accordance with the new provision. Therefore, there should be no significant impact on small entities which purchase vehicles with power windows.

In consideration of the foregoing, 49 CFR 571.118 is amended as follows:

1. Section 3(d) is revised to read as follows:

(d) During the interval between the time the locking device which controls the activation of the vehicle's engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors.

Issued on October 7, 1983.

Diane K. Steed
Deputy Administrator

48 FR 46793
October 14, 1983

MOTOR VEHICLE SAFETY STANDARD NO. 118

Power-Operated Window Systems

(Docket No. 69-11a)

S1. Purpose and scope. This standard specifies requirements for power-operated window and partition systems to minimize the likelihood of death or injury from their accidental operation.

S2. Application. This standard applies to passenger cars and multipurpose passenger vehicles.

S3. Requirements. Power window or partition systems may be operable only in the following circumstances.

(a) When the key that controls activation of the vehicle's engine is in the "ON", "START", or "ACCESSORY" position;

(b) By muscular force unassisted by a vehicle power source;

(c) Upon activation by a key-locking system on the exterior of the vehicle; or

(d) [During the interval between the time the locking device which controls the activation of the vehicle's engine is turned off and the opening of either of a two-door vehicle's doors or, in the case of a vehicle with more than two doors, the opening of either of its front doors. (48 F.R. 47693—October 14, 1983. Effective: October 14, 1983)]

35 F.R. 11797
July 23, 1970

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71-18; Notice 3)

This notice establishes a new Motor vehicle safety standard No. 119 *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, which specifies performance and labeling requirements for new pneumatic tires designed for highway use on multipurpose passenger vehicles, trucks, buses, trailers and motorcycles manufactured after 1948, and which requires treadwear indicators in tires, and rim matching information concerning those tires.

Notices of proposed rulemaking on this subject were published on August 5, 1971 (36 F.R. 14392), and July 8, 1972 (37 F.R. 13481).

The July 1972 notice proposed that, instead of including the voluminous "tire tables" of tire size designations, maximum loads and inflation pressures, and dimensions in the standard, the manufacturers continue as at present to use the industry association tire and rim manuals for the purpose of product standardization. Since the only tire characteristics relevant to the safety performance tests of the standard are general tire type, speed restrictions, maximum load rating, load range, and rim diameter, all of which are readily available or labeled on the tire itself, the tables are not necessary for the performance requirements. To prevent these private associations from having ultimate regulatory power over individual manufacturers, a provision was included in the proposal by which a manufacturer who wished to differ from the values in the association tables could do so by providing separate information to the NHTSA, to his dealers, and to the public upon request. To prevent the under-rating of tires of an established size designation, another provision would prohibit the assignment by a manufacturer of a maximum load rating to a particular tire size designation that is lower than the load rating already published elsewhere for that tire size designation.

Many domestic tire manufacturers objected to lack of tire tables on the grounds that it in effect endorsed non-standardization of tire specifications. They and some representatives of the trucking industry speculated that there might be danger of mis-match arising from the production of tires whose dimensions deviate substantially from the published dimensional specifications for tires of that size designation. Several of the domestic manufacturers recommended inclusion of the (American) Tire and Rim Association tables in the standard because of the experience that domestic manufacturers have with road conditions in the United States.

Other manufacturers, however, supported the deletion of tire tables for several reasons. They argued that a single standard would discourage innovation in tire design and suggested that the complexities of selection and maintenance of truck tires could not be reduced to a single table of values. They asserted that standardized new-tire dimensions do not eliminate the need to measure tires for proper dual matching, because tires wear differently in use and thereafter rarely match new or used tires of the same size.

Upon consideration of all relevant information, the NHTSA has concluded that the position taken in the proposal is sound, and it is adopted in the rule. The inclusion in the Code of Federal Regulations of load-inflation and dimension tables for every road tire sold in this country (they presently are included in Standard 109 only for passenger cars) would be a vastly cumbersome process, not only in its inception but as a continuous maintenance task. The NHTSA finds no justification at this time for undertaking to monitor substantively the manufacturer processes and testing that lead to the continual changes in the standard association tables, so its function in this regard would be largely clerical. The point is not, as the (U.S.) Rubber Manufacturers Association asserted, primarily one of "administrative convenience". It is that no justification has been found for locking both the government and the world tire industry into a restrictive and unwieldy system by which the Code of Federal Regulations is formally amended every time a manufacturer decides to add a tire size, or change the load rating or dimensional specifications of one of its tires. There are many reasons to avoid over-regulation; "administrative convenience" is among the least of them.

This agency has no intent to dilute the standardizing function of the trade-association table systems that presently are used to provide necessary tire and rim information to dealers and users. These systems monitor the safety aspects of tire dimension and load rating satisfactorily now without government regulation, and the NHTSA expects that they will continue to do so. No evidence has been presented of under- or over-sizing of tires that would warrant the institution of a massive government regulatory program in that area. If such a practice should arise in the future to a degree that constitutes a public hazard, the NHTSA has ample authority to deal with it specifically, as a safety-related defect, and prospectively, under its rulemaking powers.

The argument that the agency should include only the domestic Tire and Rim Association tables, thereby requiring foreign tire manufacturers to build tires under the specifications, and presumably the approval, of the domestic association, is found to be without merit. The wording and the legislative history of the National Traffic and Motor Vehicle Safety Act show a clear Congressional intent to give evenhanded treatment to domestic and foreign manufacturers of motor vehicles and equipment, and this has always been the policy of the NHTSA. This agency has no evidence that foreign associations or manufacturers lack the information necessary to produce safe tires for the American market.

Finally, the argument that the agency could or should by some means prevent "proliferation" of new tire sizes is without substance. No concrete justification has been presented for attempting to limit the introduction of new tire sizes, and to date no significant safety problems have been found caused by the addition of new tire sizes. The NHTSA assumes that the competition and consumer demand forces of the private sector will operate as in other areas of our economy, to produce a satisfactory product population.

The criteria for tire failure in the endurance and high speed laboratory tests have been substantially modified from those of the proposal in response to comments to this docket and Docket 71-10, Notice 2 (37 F.R. 19381, September 20, 1972), which proposed identical changes in the passenger car tire failure criteria. This regulation adopts the same failure criteria as were adopted in final form for passenger car tire tests on September 28, 1973 (38 F.R. 27050), and relies on several new and revised definitions found in Standard 109. The preamble to the passenger car tire amendment fully explains the modifications made, and it is only noted here that the changes are substantially in agreement with manufacturers' requests to specify the tire failures with particularity. A pre-test inspection has been added to discover failures in construction evident without dynamic testing. Additionally the required air pressure following the test run has been raised to 100 percent of the original pressure.

Several comments questioned the inclusion of all non-passenger car tires in one standard, pointing out that tire design differs radically to optimize desirable characteristics for each vehicle type and application. However, this standard does not attempt to measure the optimum characteristics of each type of non-passenger tire. This standard only establishes minimum performance characteristics which any type of tire must satisfy to be safely used on public highways. Passenger car tires have been subjected to such a standard in the past and this proposal extends a comparable minimum standard to all other tire types designed for highway use. The requirements recognize the design differences between tire types by establishing different test values for different tire types, size, construction, load ranges, and speed restrictions.

Comments to the docket requested physical tolerances and related accommodations for test purposes. These arise from misunderstanding of the legal nature of the safety standards, which are performance levels that each vehicle or item of motor vehicle equipment must meet, and not instructions for manufacturer testing. The temperature conditions for tire testing have been reworded to reflect the legal meaning and the NHTSA testing practices relative to tire standards. The proposed standard would make clear that the tire must be capable of meeting the requirements when tested at any ambient temperature up to 100° F. The legal significance of this requirement is explained in a general provision of Part 571, § 571.4, *Explanation of usage.* In NHTSA compliance testing, the ambient temperature would be maintained in a range between 90° and 100° F., and any test failure under those conditions would be considered a failure to meet the standard. Manufacturer testing should be directed at proving the tire's capability in the exercise of due care, by testing under conditions at least as adverse as any that could be established in accordance with these procedures.

The trucking industry questioned the advisability of labeling maximum inflation and load rating on the tire because it appeared to prohibit the adjustment of pressures to road conditions. The purpose of the labeling is to establish test values for the tire and to warn the user of the tire's maximum capabilities . The label does not prohibit adjustment of pressure to suit road conditions or prevent a manufacturer from recommending other inflation-load combinations on the tire or in accompanying literature to suit specific circumstances.

European manufacturers objected to the requirement that load rating be indicated by a "load range" index not in world-wide use. The primary purpose of the load range index is to indicate categories of strength within the size designations, for user information and test purposes. It should be understood that a manufacturer may use whatever additional systems he chooses to indicate his assessment of tire strength. Information such as metric equivalents and ply ratings, for example, may be added to sidewall labeling as long as the required information appears in the required format on the tire.

Several manufacturers suggested that labeling appear on only one side of a tire when both sides of the tire, as mounted, will be available for inspection. Accordingly, motorcycle tires must now be labeled on one side only, but the inaccessibility of both sidewalls on truck and bus tires for visual inspection precludes one-sidewall labeling of these categories.

Despite this inaccessibility, however, the identification code appears on one sidewall only, because placing the ID slug in the upper half of a hot process mold is a difficult and dangerous operation. In response to another labeling request, the DOT symbol must not be placed on the tire before the effective date of the standard.

Several manufacturers argued for greater design freedom in the placement of treadwear indicators because the proposed locations could generate useless, arbitrary information when applied to "lug" tread designs. In response, tread "groove", "width", and "depth" have been defined so that the treadwear indicators are placed to indicate wear in that portion of the tread which contacts the ground.

Several comments on the endurance requirement requested lower test loads and speed to approximate actual driving conditions on flat surfaces. The NHTSA does not utilize the laboratory test wheel to simply approximate road conditions but rather to apply strictly controlled amounts of stress to moving tires over long periods in order to measure a minimum level of performance. Industry testing established these values and they have been independently verified in NHTSA's Safety Systems Laboratory as an accurate gauge of tire endurance. Another manufacturer expressed confusion about the appropriate endurance test standards for mining and logging tires. These tires are generally speed-restricted tires and should be tested in accordance with the values established in Table III for all other speed-restricted tires.

In response to another comment, it should be noted that test accuracy also requires a standardized test wheel diameter, because the wheel's curvature directly affects a tire's ability to absorb strain.

Several manufacturers requested elimination of the pressure reading following the 47-hour run so that they could run the tire to destruction in accordance with industry test practices without stopping to make the measurement. This request can not be granted because the new procedures for evaluating tire failure necessitate stopping after the run to inspect the tire, in addition to stopping to take a pressure reading.

Comments raised the validity of the strength test when applied to tires incorporating recent innovations in tire design. It appears that recent changes in the construction of passenger car tires, especially the addition of belts under the tread, have tended to make the strength test specified in Standard 109 obsolete (38 F.R. 1055, January 8, 1973). However, the construction of non-passenger tires permits accurate measurement of tire strength without the "bottoming out" problem noted in the comments, if the proper plunger size and breaking energy value are used. A differential in breaking energy value between tubed and tubeless tires accommodates the smaller dimensions of the newer tubeless configurations that replace tube tires of the same load range. The "light truck" category accommodates the different design and construction materials which manufacturers use in these tires designated for this specialized service. The NHTSA does not agree that lower breaking energy values should apply to tires under 7 inches in section width as suggested in one comment, because these tires are no smaller than typical passenger car tires subjected to similar testing and similar conditions on the highway. In response to another comment, the NHTSA has concluded that differences in the construction of steel-belted tires are not sufficient to justify lower energy values in the plunger test similar to those extended to rayon tires.

Objections to the high speed performance requirements questioned the testing of all light tires (load ranges A, B, C, and D) under the same high-speed conditions. The NHTSA has eliminated speed-restricted tires from the requirements but will maintain high-speed requirements for all motorcycle, trailer, and truck tires. While it is true that these tires are specially constructed for their purpose and often are mounted on vehicles marked with speed restrictions, there is no assurance that these tires will be properly utilized. The difficulty lies with drivers who ignore rental trailer speed limits, subject boat or mobile home trailer tires to higher than recommended speeds, attempt to improve the performance of their low speed motorcycles, or drive trucks equipped with light truck tires at high speed on the highway. This probability of abuse creates a safety problem which can be met by requiring these tires to withstand such high speed abuse. Load range D tires over 15 inches in section width are presently subject to the high speed test but may be reclassified on the basis of future test experience.

Comments to the docket objected to the proposed effective date and requested up to 18 months leadtime following issuance of the standard on the grounds that the large variety of tires to be certified requires substantial enlargement of test facilities. This standard has been in various proposal stages for 4 years, however, which has provided the tire industry ample opportunity to make plans for the acquisition and installation of test facilities and therefore leadtime of 9 months is considered adequate.

In consideration of the foregoing, a new Standard 119, *New pneumatic tires for vehicles other than passenger cars*, is added to Part 571 of Title 49, Code of Federal Regulations, to read as set forth below.

Effective date: September 1, 1974.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on November 5, 1973.

James B. Gregory
Administrator

38 F.R. 31299
November 13, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other than Passenger Cars

(Docket 71-18; Notice 5)

This notice amends Standard 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, by changing the effective date from September 1, 1974, to March 1, 1975.

A major concern of manufacturers commenting on Standard 119 as it was published in final form on November 13, 1973, (38 F.R. 31299), with a September 1, 1974, effective date, was the limited leadtime in which to modify tire molds and certify the conformity of tires. Correct use of the DOT symbol, lettering height, and clarification of treadwear indicator language required attention before the changeover process could begin.

Manufacturers requested up to 11 months' additional leadtime in view of these difficulties. Amendments have been proposed that would resolve these specific problems. Because the range of non-passenger car tires is so great, however, the National Highway Traffic Safety Administration has determined that even with these changes an additional 6 months' leadtime is justified to accomplish full certification.

Other matters raised by petitions for reconsideration are presently under consideration and will be answered in accordance with the procedures of 49 CFR 553.35, *Petitions for reconsideration*.

In consideration of the foregoing, Standard 119 (49 CFR § 571.119) is amended by changing the effective date of September 1, 1974, to March 1, 1975.

Because this amendment creates no additional burden, and because changeover scheduling must begin immediately, it is found for good cause shown that notice and public procedure thereon are impracticable and unnecessary.

(Secs. 103, 119, 201, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on January 29, 1974.

James B. Gregory
Administrator

39 F.R. 4087
February 1, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other than Passenger Cars

(Docket 71–18; Notice 6)

This notice responds to petitions for reconsideration on Standard 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, published November 13, 1973 (38 F.R. 31299). In response to comments by twelve tire manufacturers and trade associations, the definitions, labeling, and performance provisions of the standard are amended in several respects.

Justification for Issuance of Standard 119

The Rubber Manufacturers Association (RMA), supported by most domestic tire manufacturers, petitioned for withdrawal of Standard 119 on the grounds that promulgation of the standard did not satisfy the criteria for the establishment of Motor Vehicle Safety Standards set out in § 103 of the National Traffic and Motor Vehicle Safety Act of 1966. Section 103(f) of the Act requires that the formulation of a standard include consideration of its appropriateness for particular items of motor vehicle equipment, relevant safety data, and the extent to which it will contribute to carrying out the purposes of the Act. As formulated a standard must be practicable, meet the need for motor vehicle safety, and be stated in objective terms.

In petitioning for withdrawal of Standard 119 for failure to "meet the need for motor vehicle safety," the RMA and those tire manufacturers who support its position effectively assert that no tire safety hazard exists which can be met by Standard 119. The National Highway Traffic Safety Administration (NHTSA) does not agree.

Congress recognized a tire safety problem. The Senate held hearings on and considered a bill devoted totally to tire safety (S1643). The House included a separate title in H.R. 13228 to emphasize tire safety as a particularly important area for the issuance of safety standards.

> In a number of bills which have been introduced in both Houses as well as in a bill which has passed the Senate (S.2669) the necessity for standards for tires was considered as an independent problem and without reference to its relationship to the total traffic safety problem. S.2669 is confined only to the improvement of tires for passenger cars and station wagons. The committee decided that although *tires are a highly important part of the total traffic safety problem* they are, nevertheless, an integral part of it and should be dealt with in the context of the problem and not in a piecemeal fashion. . . .
>
> However the committee did feel that it was necessary to emphasize this aspect of the safety problem and to establish certain specific requirements which should be contained in the Secretary's standards on tires. (emphasis supplied) H.R. Rep. No. 1776, 89th Cong., 2d Sess. 32 (1966).

On the House floor, Representative Springer detailed the effect of the legislation on motor vehicle equipment.

> Obviously, the most important piece of equipment which comes to mind is the tire. The other body treated this subject in separate legislation, but it seems to me, and it did to our committee, that tire standards must be part and parcel of any legislation which seeks to impose standards of safety for the cars on the highway. Consequently, a portion of the bill was devoted specifically to this subject. It requires minimum standards for all tires, and then sees to it that the buyer will have all the information he needs to make a decision as to the tire he needs.

> 112 Cong. Rec. 18,780 (daily ed. Aug. 17, 1966)

Congress showed particular interest in passenger car tires, but did not limit the legislation to them, as suggested by Firestone in its petition for reconsideration. As the House report notes, Title II represents a broadening of the tire safety issue from passenger cars and station wagons. The language of Title II refers to tires of "each motor vehicle" and to a uniform tire quality grading system "for motor vehicles." Section 204 is devoted to regrooved tires which are commonly utilized on non-passenger cars.

The NHTSA has concluded that the tire safety problems recognized by Congress can best be met by Standard 119. The standard requires labeling and tire-rim matching information to aid proper application of the tire, and minimum performance levels to ensure adequate designed-in safety for normal use and predictable abuse on the road. The standard is directed at misuse of tires as well as their correct use.

It is true that Bureau of Motor Carrier Safety statistics indicate that professional maintenance, cost consciousness, and frequent state inspections result in a lower than normal number of tire failures on interstate haulers. These figures, however, are not representative of tire conditions throughout the multipurpose passenger vehicle (MPV), truck, bus, motorcycle, and trailer categories. Congress mandated minimum tire safety standards although it was aware that tire failure statistics were difficult to isolate, realizing that tire design, while not a major cause of failures in well-maintained tires, could offer a margin of safety where tires are misused. Hearings on S.1634 Before the Senate Commerce Committee on Tire Safety, 89th Cong., 1st Sess., ser. 89–37 at 41 (1965); Hearings on S.3005 Before Senate Commerce Committee on Traffic Safety, 89th Cong., 2nd Sess., ser. 89–49 at 158, 159 (1966). In its formulation of the standard, the NHTSA considered data which showed that worn and misapplied tires create a significant safety hazard. Standard 119 ensures that the information required by Congress to be on tires, along with additional tire-rim matching information and treadwear indicators, are available to the unknowledgeable individual who must select, maintain, and replace non-passenger tires periodically. The RMA itself argued for the inclusion of load-rating information in this standard as an effective means to eliminate the dangers of proliferation and misapplication of tire sizes. In the area of tire design, the minimum performance levels in Standard 119 ensure a margin of safety for persons who may misapply or abuse tires despite the label information and treadwear warnings.

The NHTSA experience with performance standards for passenger car tires also supports Standard 119 rulemaking. Since the beginning of certification testing by the manufacturers and compliance testing by the NHTSA, the percentage of test failures has dropped from approximately 5.6% to less than 1%. At the same time 88 recalls of 1,436,118 tires have removed from the road substantial numbers of tires which could not be shown in the exercise of due care to be able to meet the minimum requirements. Standard 119 has similar performance tests, calculated to produce close surveillance of test failure percentages and recalls when a faulty tire design is identified. The performance test levels vary according to tire type to ensure that the standard is reasonable, practicable, and appropriate for the particular tire design in its intended service application.

The NHTSA has found that Standard 119 will weed out faulty tire design and promote safety. The test values of Standard 119 were originally proposed by industry and checked by the NHTSA at its Safety Systems Laboratory. The RMA conducted a similar series of tests at that time and later endorsed the requirements as modified in minor respects:

> The laboratory tests and values in the proposed FMVSS 119 as amended by our comments would set standards of performance that would enable the industry to design tires that would ensure safe operation on the highways. Comment #4 to Docket 1–5, Notice 7 (p 6).

By reference to *H & H Tire Company v. United States Department of Transportation*, 471 F2d 350 (7th Cir 1972), the RMA and Firestone raised the issue of Standard 119's practicability. This requirement, at § 103(a) of the Act, was interpreted in *H&H* to mean that the NHTSA must determine the technological and economic consequences of the standard on the regulated industry. In that case the Court determined that the retread tire industry could be destroyed by the expense of major product redesign or the loss of business which could result from passing on these costs in higher prices to the typical retread consumer. The Court also pointed out that the retread consumer might use older worn tires longer than previously and thereby in effect increase the tire hazard problem in response to Standard 117.

In contrast, the NHTSA has determined that compliance with Standard 119 does not require significant or impracticable technological change. Tests run at the Safety Systems Laboratory indicate that a sampling of production-run tires can meet the required performance levels, as they are now constructed. An analysis of benefits and costs demonstrates that the costs of additional testing are less than the estimated savings in property and lives. Finally, the consumer of new tires is less likely than the retread consumer to shift his tire purchase habits and has less opportunity to do so. The NHTSA has carefully determined the technological and economic impact of Standard 119 on the new tire industry and found it to be practicable.

The NHTSA totally disagrees with the RMA and Firestone in their final argument that safety-related defect notification offers adequate protection to consumers without the addition of a safety standard. Firestone inaccurately equates the effect of a standard with that of a notification campaign, claiming that in either case a manufacturer must recall tires containing defects or face civil penalties. Issuance of a standard imposes significantly greater responsibility on a manufacturer to assure himself in the exercise of due care that his product is safe before it is sold and subsequent use reveals a safety-related defect.

Technical Consideration of Standard 119

The Application section (S3.) raised several questions about the standard's relationship to Standard 109-type tires, experimental tires, and low speed and off-road vehicle tires. The standard applies to new tires designed for highway use on non-passenger-car motor vehicles. The present language makes clear that tires which do not meet these criteria are not subject to the standard, including those tires subject to Standard 109. The tire manufacturer himself must determine whether his tires, restricted or not to speeds under 35 mi/h, or used on slow-moving vehicles on or off the highway, were designed by him for highway use. As an example, Dunlop cited moto-cross tires which use the public highway "during the course of competitions." Without evidence to the contrary, however, the NHTSA assumes that these tires are used to get to and from the competition over the public highways. In answer to a related request for interpretation by Bridgestone, it is the designed and intended use of the tire (as realistically anticipated by the manufacturer) that matters, not a simple marking such as "Not For Highway Use" on the tire sidewall. In the case of "experimental" or "survey" tires the tires are designed for highway test purposes and are subject to the standard.

The definition of light truck tire has been revised in response to comments from the RMA and the Japan Automobile Tire Manufacturers Association. They cited a number of light truck tires which may or may not share a common size designation or dimensions with passenger tires, but still require special test values because of their heavy-service construction.

Standard 119 does not include the voluminous "tire tables" of tire size designation, maximum loads and inflation pressures, and dimensions requested by the domestic tire industry. An explanation of this approach accompanied issuance of the rule (38 F.R. 31299, November 13, 1973). While the RMA and Goodyear have restated their earlier position that product standardization can only be assured by Government publication of industry association tables, they did not respond to the extensive justification made with the rule. The NHTSA concludes that its determination is sound.

Nearly all tire manufacturers commented on Standard 119's labeling provisions and the amount of leadtime necessary to implement them. To resolve the most pressing problems, the NHTSA has already issued notices that postpone the effective date of the standard 6 months and propose a lettering size and depth, use of the DOT symbol prior to the standard's effective date, and clarification of the treadwear indicator requirement. (39 F.R. 4087, February 1, 1974, 39 F.R. 3967, January 31, 1974). All other petitions which concern the labeling provisions are treated in this response.

The RMA and the European Tyre and Rim Technical Organization (ETRTO) requested changes in paragraph S6.5(d) ("Tire marking"), several of which are adopted in this amendment. The word "corresponding" is inserted before "inflation pressure" to accommodate tires whose maximum load rating is not at maximum inflation. Punctuation is removed from the legend that appears on the tire to simplify stamping. The example is revised to make clear that "TIRE RATED FOR SINGLE AND DUAL LOAD" and "TIRE RATED ONLY FOR SINGLE LOAD" do not appear on the tire sidewall. ETRTO suggested that a title appear on the tire to qualify the information provided, but the NHTSA has concluded that the information alone is more helpful to the unknowledgeable user, and that a knowledgeable user would refer to the tire tables for exact information before changing tire inflation pressure.

Paragraph S6.5(e) on speed restricted tires has been clarified to limit the requirement to tires restricted to 55 mi/h or less. S6.5(f) remains unchanged, because the National Traffic and Motor Vehicle Safety Act of 1966 requires that the actual number of plies and ply composition appear on the tire sidewall. The words "tube type" appear on tires under S6.5(g) because many consumers are unaware of the significant distinctions between tube type and tubeless tires. Dunlop's request that treadwear indicators be required on tires that are regrooved is beyond the authority under which Standard 119, applying only to new tires, was issued.

Paragraph S6.5(j) calls for a single letter to appear on the tire to indicate categories of strength within the size designation, for user information and test purposes. As the ETRTO pointed out, a requirement for any additional wording such as "load range" could confuse international standardization efforts. Manufacturers are, of course, entitled to add labeling information as long as the required information appears in the required format on the tire.

The maximum load rating provision in S6.6 requires tires of a particular size to have a maximum load rating at least as great as the lowest rating published for that size. In this way the publications do not mislead a consumer who assumes that a particular tire size must have only the load ratings listed. The RMA advocated that more particular load rating information be supplied to aid in actual tire selection. Reference to any factors other than tire size, however, would detract from the desired concept that, for one tire size, there is one lowest maximum load rating, and that load rating is published.

Two substantial requests were raised with regard to the endurance requirement. Uniroyal petitioned for a reduction in the duration of the three test phases to 4 hours each. The NHTSA is considering that submission but must deny action on it at this time because an independent evaluation of the procedures has not yet been conducted, and because there has not been notice or opportunity to comment on the proposal by all interested persons.

The RMA petitioned for 34-hour endurance testing of all tires subject to the high speed test (S6.3) on the grounds that the 47-hour speed/endurance test would be redundant. The NHTSA agrees and has revised Table III accordingly.

The ETRTO proposed new test values for some motorcycle tires, but the request was unclear as to the meaning of the 62 mi/h criterion and the unsupported request cannot be granted. If, in the future, the ETRTO petitions for rulemaking to revise the table, an explanation of the criterion and a justification for the test values would permit an informed decision.

Comments to the strength test questioned plunger size and energy values, the computation procedures, and the appropriateness of the test to mobile home, special trailer, wide base, and radial tires.

The RMA argued that the limited service of most mobile home and special trailer tires could not justify the increased cost necessary to upgrade the strength of the tires to meet the requirement. The NHTSA has consistently treated mobile homes and other trailers as full-fledged motor vehicles and applied applicable standards rigorously to reduce the number of crashes in which mobile homes are involved, as indicated by BMCS statistics. The RMA request is denied to ensure that equally-rated tires on towed and towing vehicles will, in fact, meet equal minimum strength requirements.

The RMA and ETRTO generally advocated larger plungers or reduced energy values for tires and the ETRTO petitioned for the exclusion of radial tires from the strength test. The NHTSA has determined that the established values and plunger sizes, drawn from industry experience, adequately measure tire strength. Any future petitions for rulemaking to change these values should be accompanied by detailed supporting data, as was submitted by Uniroyal in its petition for reconsideration.

Comments again requested that a plunger which contacts the rim be considered to have established an energy value which meets the strength requirement. The NHTSA reiterates its position that the standard's present energy values measure the strength of a well-constructed non-passenger car tire before the tire breaks or the plunger contacts the rim. Specific test values may be revised based on future test experience, but revision of the calculation procedures used for all tires is not justified. The request for three plunger applications in the case of 12-in. or smaller diameter tires has been granted.

Michelin and the ETRTO have inquired as to the NHTSA's position with regard to tubeless tires above load range J. Such tires, when marketed in the United States, are subject to this standard, and the NHTSA would like the benefit of detailed description of, and test experience with, these tires before it establishes test requirements. It is requested that support for ETRTO or Michelin values be submitted to the NHTSA Tire Division.

The high speed performance requirement was adopted to test different tire characteristics from those tested under the endurance performance requirement. The test is run only on non-speed-restricted tires in the lighter load ranges because, for tires of heavier construction, the endurance test alone develops temperatures which evaluate all the characteristics satisfactorily. The RMA and several manufacturers have pointed out that the endurance test can serve this purpose for large tires even in the lighter ranges, and the NHTSA, therefore, restricts the high speed requirements to motorcycle tires and to non-speed-restricted tires of 14.5-in nominal rim diameter or less marked Load Range A, B, C, or D. Light truck tires and other tires which are 14.5-in and smaller remain subject to the high speed requirements because the NHTSA has determined that the high speed test measures different values than the endurance test in these smaller sizes.

The definition of tire failure is closely related to the endurance and high speed performance tests. The RMA and several tire manufacturers requested re-definitions of several terms and revision of the tire cooling procedures related to tire failure. The NHTSA has established Docket 71–10, *New pneumatic tires, revised performance requirements*, to treat the re-definition of tire failure, and will respond to these issues in a notice to that docket.

Interested persons should remember that, in addition to the amendments set forth below, the NHTSA has already amended the effective date of the Standard to March 1, 1975, and has proposed amendments to the lettering, DOT certification, and treadwear provisions which will be acted on when comments have been considered.

In consideration of the foregoing, amendments are made to Parts 571 and 574 of Title 49, Code of Federal Regulations. . . .

Effective date: March 1, 1975.

(Secs. 103, 112, 113, 114, 119, 201, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1402, 1403, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on February 7, 1974.

James B. Gregory
Administrator

39 F.R. 5190
February 11, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71-18; Notice 7)

This notice amends Standard No. 119, *New pneumatic tires for vehicles other than passenger cars*, 49 CFR 571.119, to specify lettering sizes and modified treadwear indicator requirements for tires. In addition, it amends Part 574, *Tire Identification*, 49 CFR 574, to permit the labeling of certain tires with the symbol DOT prior to the effective date of the standard. This notice also responds to petitions for reconsideration of Standard 119's effective date by maintaining the present date of March 1, 1975.

To avoid a costly production shutdown on the effective date to engrave tire molds with the DOT compliance symbol required by the standard, the National Highway Traffic Safety Administration (NHTSA) proposed a modification of the Part 574 prohibition on the symbol's use prior to the effective date (39 F.R. 3967, January 31, 1974). The Rubber Manufacturers Association and five tire manufacturers agreed that the DOT should be engraved on tire molds prior to the effective date, but objected to the expense of covering the DOT with a label stating that "no Federal motor vehicle safety standard applies to this tire," when the DOT appears on tires which (presumably) satisfy Standard 119 requirements. Firestone pointed out that the large label size could obscure other label information. Goodrich noted that, as proposed, the DOT could be molded on tires which met no standard and could mislead a user if the label fell off.

The NHTSA will not permit the appearance of the DOT compliance symbol on any item of motor vehicle equipment to which no standard is applicable. The terms "applicability" and "applies" have only one meaning for Federal motor vehicle safety standards: that the vehicle or equipment concerned is subject to a safety standard. To permit use of the DOT symbol on vehicles or items of motor vehicle equipment to which no standard applies would confuse the meaning of the symbol and the concept of compliance.

In response to Firestone and Goodrich, the NHTSA has modified the lettering size on the label and limited use of the DOT symbol to tires for which a standard has been issued. With the small lettering size, the rubber labels used on retread tires can be applied over the DOT symbol in fulfillment of the requirement. Another method which manufacturers did not mention but which would be permissible is the removal of the DOT at the same time imperfections are buffed off the tire.

All comments on the proposal objected to the specific location requirements for treadwear indicators based on the concept of even tread wear across the tread width. Goodyear demonstrated in a meeting with the NHTSA Tire Division on February 13, 1974, and detailed in its submission to the Docket, the difficulty in equating ideal tire wear with actual road experience. They recommended the simpler concept that a tire has worn out when any major tread groove has only $\frac{2}{32}$ in tread remaining. The NHTSA has concluded that treadwear indicators must be placed at the discretion of the manufacturer to give a person inspecting the tire visual indication of whether the tire has worn to a certain tread depth. Accordingly, the lateral location requirements for treadwear indicators have been deleted from the standard.

There was no discussion of the lettering size and depth proposal, and these proposals are adopted as proposed.

The comments requested reconsideration of the standard's March 1, 1975, effective date (published February 1, 1974, 39 F.R. 4087), asserting the need for 18 months of lead time following publication of this notice to engrave tire molds as required by the standard. The NHTSA has found that 11 months is sufficient leadtime to accomplish these changes, and accordingly these petitions are denied.

To correct an inadvertent omission in the amendment of Standard No. 119 in response to petitions for reconsideration (39 F.R. 5190, February 11, 1974), superscripts are added to Table III entries for "All other, A, B, C, D range tires".

In consideration of the foregoing, Parts 571 and 574 of Title 49, Code of Federal Regulations, are amended. . . .

Effective date: Standard No. 119 amendments: March 1, 1975. Part 574 amendment: April 3, 1974. Because the Part 574 amendment creates no additional burden, and because modification of tire molds must begin immediately, it is found for good cause shown that an effective date less than 180 days after issuance is in the public interest.

(Secs. 103, 112, 119, 201, Pub. L. 89–563, 80 Stat. 718; 15 U.S.C. 1392, 1401, 1407, 1421; delegation of authority at 49 CFR 1.51.)

Issued on March 28, 1974.

James B. Gregory
Administrator

39 F.R. 12104
April 3, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 74–25; Notice 2)

This notice amends the definition of "test rim" in 49 CFR 571.109 (Motor Vehicle Safety Standard No. 109) and modifies related provisions of that section and § 571.110 (Motor Vehicle Safety Standard No. 110). A conforming amendment is made to similar provisions in § 571.119 (Motor Vehicle Safety Standard No. 119). The notice of proposed rulemaking on which this amendment is based was published on July 10, 1974 (39 F.R. 25329).

The definition of "test rim" has previous to this amendment referenced the 1967 and earlier editions of publications of various foreign and domestic tire and rim associations as the source for determining rim specifications and appropriate tire/rim matching information for testing tires to the requirements of Motor Vehicle Safety Standard No. 109, and for equipping passenger cars pursuant to Motor Vehicle Safety Standard No. 110. The Rubber Manufacturers' Association petitioned that this reference be changed because the publications have become outdated in terms of the rim information they provide. This amendment, which adopts the proposed rule of July 10, 1974, in essentially the form proposed, deletes the references to the 1967 and earlier publications and substitutes for them the publications of the various associations current at the time of tire manufacture.

Under the amendment, a "test rim" will be any rim listed for use with a tire size designation in any of the current publications of the various foreign and domestic tire and rim associations. The listing will apply to all tires that fit the description (by tire size designation, use category, etc.) unless the publication itself or a separately published manufacturer's document states otherwise. A manufacturer wishing to except any tire manufactured by him from any listing would be expected to request the association to publish the exception in its publication. If it does not, the manufacturer must himself publish the exception in his own listing, which he must distribute to his dealers, this agency, and to any member of the public on request. The language of the proposal is clarified, and a conforming amendment made to Standard No. 119 to show that an exception must be published in each association publication listing the tire and rim combination. The amendment further specifies that a "listing" of a rim must contain dimensional specifications, including diagrams, for the rim. This is necessary to provide for uniformity of rim dimensions and reflects the present practice of association publications of publishing such dimensional specifications. However, dimensional specifications or a diagram of a rim need not be included in manufacturers' separate listings if the specifications and diagram for the rim appear in each association publication where it is listed.

By referencing the current publications, the amendment ends the need for Appendix "A" of Standard No. 110, which lists tire/rim combinations approved for use subsequent to the 1967 and earlier associations publications. The associations and various manufacturers should ascertain that all tire/rim combinations presently listed in that Appendix are incorporated into at least one of their respective publications before the effective date of this amendment. Moreover, the addition of new tire/rim combinations subsequent to the effective date becomes the sole responsibility of the industry. Appendix "A" of Standard No. 109, listing tire size designations, is not affected by this amendment.

An effect of the amended definition of test rim is to clarify this agency's position that each tire must be able to pass each performance requirement (except that for physical dimensions) of Standard No. 109 with any rim with which it is listed, regardless of rim width, unless that tire is specifically excepted from each listing where it appears. The requirements for physical dimensions must be met only on a test rim of the width specified for the tire size designation in Standard No. 109. A tire failing the requirements on any test rim would be considered as having failed the requirements on all test rims. This continues existing NHTSA enforcement policy.

One of the two comments received regarding the proposal objected to this aspect of the amendment, arguing that some manufacturers have traditionally certified conformity on the basis of test results using only the test rims of the specified test rim width and that no safety problems had been encountered. The NHTSA believes, however, that the interest of safety demands that manufacturers ensure that tires certified as conforming to Standard No. 109 will conform to the standard's requirements on any rim which the manufacturer lists for use with the tire and with which the tire may consequently be used in service. This position has been reflected in the guidelines for the additions of new tire/rim combinations to the Appendix of Standard No. 110, which have required that the manufacturer demonstrate conformity to Standard No. 109 on each newly requested rim. If a manufacturer doubts the ability of his tires to conform to the standard on certain recommended rims, he has the option of excepting his tires from being used with those rims. No other objections to the proposed rule were received.

In light of the above, amendments are made to 49 CFR §§ 571.109, 571.110, and 571.119 . . . .

Effective date: August 5, 1975 for Standards No. 109 and 110; March 1, 1975, for Standard No. 119. The amendment to Standard No. 119 is of a clarifying nature, and should be made effective with the existing effective date of that standard. The amendment does not require substantial leadtime for conformity, and it is found for good cause shown that an effective date less than 180 days from publication is in the public interest.

(Secs. 103, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718; 15 U.S.C. §§ 1392, 1407, 1421, 1422; delegation of authority at 49 CFR 1.51.)

Issued on January 31, 1975.

James B. Gregory
Administrator

40 F.R. 5529
February 6, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

(Docket No. 71–18, Notice 10)

This notice establishes a uniform tire testing temperature for the test requirements of the Uniform Tire Quality Grading regulation and the Federal motor vehicle safety standard for non-passenger-car tires. This amendment simplifies existing requirements by permitting various tire tests to be conducted at the same temperature.

Effective date: July 17, 1978.

For further information contact:

Arturo Casanova III, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–1715).

Supplementary information: The National Highway Traffic Safety Administration (NHTSA) proposed on March 3, 1977, to amend the ambient temperature conditions for tire testing contained in Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (49 CFR 571.119), and in Part 575, *Uniform Tire Quality Grading* (49 CFR 575.104) (UTQG). The purpose of this proposed amendment was to harmonize existing tire testing temperatures as requested by the Goodyear Tire and Rubber Company. The ambient temperatures were previously specified as follows:

Standard No. 109: "100±5° F."

Standard No. 119: "any temperature . . . up to 100° F."

UTQG: "at 105° F."

In the notice of proposed rulemaking, the agency proposed to amend Standard No. 119 and UTQG to reflect the tire temperature utilized in Standard No. 109 (100±5° F.). As an alternative method of expressing the test temperature, the NHTSA proposed to amend the standards to specify "any temperature up to 95° F.

Five comments were received in response to that proposal. All comments favored the proposed amendment that would have instituted a 100±5° F. temperature. The Vehicle Equipment Safety Commission did not take a position on this proposal.

After consideration of the issues involved in the proposal and review of the comments, the agency has determined that the test temperature should be expressed as "any temperature up to 95° F." Accordingly, Standard No. 119 and UTQG are amended to specify temperature testing at "any temperature up to 95° F." It is the NHTSA's opinion that the 95° F. test temperature is in effect the same test temperature as would be achieved by using the 5-degree tolerance (100±5).

The NHTSA has often stated in interpretations on similar issues that the use of tolerances in safety standards reflects a misunderstanding of the legal nature of the safety standards. Standards are not instructions, but performance levels that vehicles or equipment are required by law to be capable of meeting. Any tolerance in this context would be meaningless and misleading, since it would merely have the effect of stating a performance level that the equipment must meet when tested by the government, but in a confusing manner.

Recognizing that no measurement is perfectly precise, a manufacturer's tests should be designed to show, using tire testing temperature as an example, that his tires will comply with the requirements at exactly 95° F. This may be done in at least two ways: (1) by using a test method that corresponds so closely to the required temperature that no significant differences could occur as a result of differences between the actual temperature and the specified one, or (2) by determining which side of the specified temperature is adverse to the product tested, and being sure that the actual temperature of the test differs from the specified one on the adverse side.

The amendment of Standard No. 119 and UTQG to reflect the 95° F. temperature creates a different temperature phraseology for those standards than exists in Standard No. 109 which still has the 100±5° F. temperature. As stated earlier, the NHTSA considers the Standard No. 109 temperature tolerance to mean in actuality "any temperature up to 95° F." However, since modification of that standard was not proposed in the earlier notice, the agency does not amend it in this final rule. However, the agency intends to issue an interpretive amendment that will amend Standard No. 109 to adopt the alternative expression for tire temperature testing (any temperature up to 95° F.) unless objections are received.

In accordance with Departmental policy encouraging analysis of the impact of regulatory actions upon the public and private sectors, the agency has determined that this modification will result in no appreciable safety gains or losses. These amendments may result in slightly lower costs for tire temperature testing since all temperatures will be uniform.

Since these amendments relieve restrictions and impose no additional burdens, it is found for good cause shown that an immediate effective date is in the public interest.

In consideration of the foregoing, the following amendments are made in Parts 571 and 575 of Title 49, Code of Federal Regulations. . . .

The program official and lawyer principally responsible for the development of this rulemaking document are Arturo Casanova and Roger Tilton, respectively.

(Secs. 103, 112, 119, 201, 203, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1421, 1423); delegation of authority at 49 CFR 1.50.)

Issued on July 12, 1978.

Joan Claybrook
Administrator

43 F.R. 30541-30542
July 27, 1978

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 119 AND PART 574

Tire Identification and Recordkeeping; New Pneumatic Tires for Motor Vehicles Other Than Passenger Cars

[Docket No. 84-10; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 119, *New pneumatic tires for motor vehicles other than passenger cars* and Part 574, *Tire identification and recordkeeping,* to permit the marking required by that standard to appear at a point other than between the maximum section width and the bead of the tire. This amendment, which responds to a petition for rulemaking from Michelin Tire Corporation, will permit the manufacture of tires where the maximum section width of the tire is at the bead. The purpose of the current requirements is to locate certain safety markings in an area where they would not be scuffed off when the sidewall of the tire hits a curb or other objects, and so that accurate information would remain on the sidewall after a tire has been retreaded. However, we have concluded that alternatives are available to solve these concerns, and therefore, the rule should be amended to permit the introduction of a new tire technology.

EFFECTIVE DATE: May 2, 1985.

SUPPLEMENTARY INFORMATION: On September 26, 1984 (49 FR 37815) NHTSA published a notice proposing an amendment to Standard No. 119, *New pneumatic tires for motor vehicles other than passenger cars* and Part 574, *Tire identification and recordkeeping,* in response to a petition for rulemaking from Michelin Tire Corporation (Michelin). Michelin petitioned the agency for a change in those standards because of a new tire that it had developed. As currently written, those standards require certain marking to appear between the maximum section width and the bead of a tire. However, Michelin's new tire has its maximum section width at the bead and thus it could not mark these tires at the location currently specified in the agency's standards.

The purpose of the current requirement is that the marking be located in an area where the safety marking would not be scuffed off when the sidewall of the tire hits a curb or other objects. In addition, the requirement was meant to ensure that accurate information would remain on the sidewall after the tire has been retreaded. The September 1984 notice has an extensive discussion of the rationale underlying the agency's proposal and readers are referred to that notice for further details. In brief, the September notice explained that while the reasons underlying the requirement are still valid, there are alternatives available to solve these concerns, and therefore, the rule should be amended to permit the introduction of a new concept in tires.

The agency received no comments on the proposal. The agency, therefore, is adopting it for the reasons set forth in the September notice.

In consideration of the foregoing, Title 49 of the Code of Federal Regulations is amended as set forth below:

Part 571

1. Section S6.5 of 571.119 is amended to read as follows:

S6.5 *Tire markings.* Except as specified below, each tire shall be marked on each sidewall with the information specified in paragraphs (a) through (j) of this section. The markings shall be placed between the maximum section width (exclusive of sidewall decorations or curb ribs) and the bead on at least one sidewall, unless the maximum section width of the tire is located in an area which is not more than one-fourth of the distance from the bead to the shoulder of the tire. If the maximum section width falls within that area, the markings shall appear between the bead and a point one-half the distance from the bead to the shoulder of the tire, on at least one sidewall. The markings shall be in letters and numerals not less than 0.078 inches high and raised above or sunk below the tire surface not less than 0.015 inches, except that the marking depth shall be not less than 0.010 inches in the case of motorcycle tires. The tire identification and the DOT symbol labeling shall comply with part 574 of this chapter. Markings may appear on only one sidewall and the entire sidewall area may be used in the case of motorcycle tires and recreational, boat, baggage, and special trailer tires.

Part 574

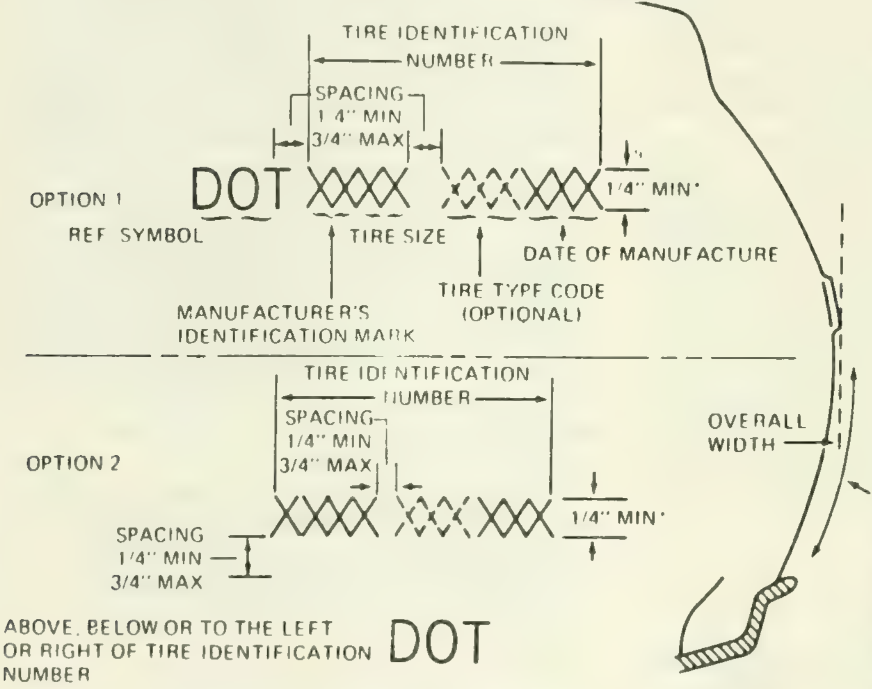
1. Figure 1 in §574.5 of Part 574 is revised to appear as follows:

Issued on March 12, 1985.

Diane K. Steed
Administrator

50 FR 10772
March 18, 1985

Figure 1


TIRE IDENTIFICATION NUMBER
SPACING 1/4" MIN 3/4" MAX
OPTION 1
DOT XXXX XXXXXX
1/4" MIN*
REF SYMBOL
TIRE SIZE
DATE OF MANUFACTURE
TIRE TYPE CODE (OPTIONAL)
MANUFACTURER'S IDENTIFICATION MARK
TIRE IDENTIFICATION NUMBER
SPACING 1/4" MIN 3/4" MAX
OPTION 2
XXXX XXXXXX
1/4" MIN*
SPACING 1/4" MIN 3/4" MAX
ABOVE, BELOW OR TO THE LEFT OR RIGHT OF TIRE IDENTIFICATION NUMBER
DOT
OVERALL WIDTH

Locate all required labeling in lower segment of one sidewall between maximum section width and bead so that data will not be obstructed by rim flange, unless maximum section width falls between the bead and one-fourth of the distance from the bead to the shoulder of the tire. For tires where the maximum section width falls in that area, locate all required labeling between the bead and one-half the distance from the bead to the shoulder so that data will not be obstructed by rim flange.

*5/32" LETTERING FOR TIRES OF LESS THAN 6.00 INCH CROSS SECTION WIDTH AS WELL AS THOSE LESS THAN 13" BEAD DIAMETER MAY BE USED

FIGURE 1 IDENTIFICATION NUMBER FOR NEW TIRES

Notes:

1. Tire identification number shall be in Futura Bold, Modified Condensed or Gothic characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Type Code if ommited, or partially used, place Date of Manufacture in the unused area.
4. Other print type will be permitted if approved by the administration.

MOTOR VEHICLE SAFETY STANDARD NO. 119

New Pneumatic Tires for Vehicles Other Than Passenger Cars

S1. Scope. This standard establishes performance and marking requirements for tires for use on multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles.

S2. Purpose. The purpose of this standard is to provide safe operational performance levels for tires used on motor vehicles other than passenger cars, and to place sufficient information on the tires to permit their proper selection and use.

S3. Application. This standard applies to new pneumatic tires designed for highway use on multipurpose passenger vehicles, trucks, buses, trailers and motorcycles manufactured after 1948.

S4. Definitions. All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

"Light truck tire" means a tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

"Model rim assembly" means a test device that (a) includes a rim which conforms to the published dimensions of a commercially available rim, (b) includes an air valve assembly when used for testing tubeless tires or an innertube and flap (as required) when used for testing tube-type tires, and (c) undergoes no permanent rim deformation and allows no loss of air through the portion that it comprises of the tire-rim pressure chamber when a tire is properly mounted on the assembly and subjected to the requirements of this standard.

S5. Tire and rim matching information.

S5.1 Each manufacturer of tires shall ensure that a listing of the rims that may be used with each tire that he produces is provided to the public. For purposes of this section, each rim listing shall include dimensional specifications and a diagram of the rim. However, a listing compiled in accordance with paragraph (a) of this section need not include dimensional specifications or a diagram of a rim if the rim's dimensional specifications and diagram are contained in each listing published in accordance with paragraph (b). The listing shall be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Tire Division, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; or

(b) Contained in publications, current at the date of the manufacture of tire or any later date, of at least one of the following organizations:

The Tire and Rim Association.

The European Tyre and Rim Technical Organisation.

Japanese Industrial Standards.

Deutsche Industrie Norm.

The Society of Motor Manufacturers and Traders, Ltd.

British Standards Institution.

Scandinavian Tire and Rim Organisation.

S5.2 Information contained in a publication specified in S5.1(b) which lists general categories of tires and rims by size designation, type of construction, and/or intended use, shall be considered to be manufacturer's information pursuant to S5.1 for the listed tires, unless the publication itself or specific information provided according to S5.1(a) indicates otherwise.

S6. Requirements Each tire shall be capable of meeting any of the applicable requirements set forth below, when mounted on a model rim assembly corresponding to any rim designated by the tire manufacturer for use with the tire in accordance with S5. However, a particular tire need not meet further requirements after having been subjected to and met the endurance test (S6.1), strength test (S6.2), or high speed performance test (S6.3).

S6.1 Endurance.

S6.1.1 Prior to testing in accordance with the procedures of S7.2, a tire shall exhibit no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

S6.1.2 When tested in accordance with the procedures of S7.2:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, or bead separation, chunking, broken cords, cracking, or open splices.

(b) The tire pressure at the end of the test shall be not less than the initial pressure specified in S7.2(a).

S6.2 Strength. When tested in accordance with the procedures of S7.3 a tire's average breaking energy value shall be not less than the value specified in Table II for that tire's size and load range.

S6.3 High speed performance. When tested in accordance with the procedures of S7.4, a tire shall meet the requirements set forth in S6.1.1 and S6.1.2(a) and (b). However, this requirement applies only to motorcycle tires and to non-speed-restricted tires of 14.5-in nominal rim diameter or less marked load range A, B, C, or D.

S6.4 Treadwear indicators. Except as specified below, each tire shall have at least six treadwear indicators spaced approximately equally around the circumference of the tire that enable a person inspecting the tire to determine visually

TABLE I—Strength Test Plunger Diameter

Tire type:	Plunger Diameter (inches)
Light truck	$\frac{3}{4}$
Motorcycle	$\frac{5}{16}$
Tires for 12-inch or smaller rims, except motorcycle	$\frac{3}{4}$
Tires other than the above types:	
Tubeless:	
17.5-inch or smaller rims	$\frac{3}{4}$
Larger than 17.5-inch rims:	
Load range F or less	$1\frac{1}{4}$
Load range over F	$1\frac{1}{2}$
Tube type:	
Load range F or less	$1\frac{1}{4}$
Load range over F	$1\frac{1}{2}$

TABLE II—Minimum Static Breaking Energy (Inch-Pounds)

Plunger diameter	$\frac{5}{16}$ Inch	$\frac{3}{4}$ Inch		$1\frac{1}{4}$ Inch		$1\frac{1}{2}$ Inch	
Tire characteristic	Motorcycle	All 12-inch or smaller rim size	-Light truck -17.5 inch or smaller Rim Tubeless	Tube type	Tubeless	Tube type	Tubeless
Load range							
A	150	600	2000	----	----	----	----
B	300	1200	2600	----	----	----	----
C	400	1800	3200	6800	5100	----	----
D	---	2400	4550	7900	6500	----	----
E	---	3000	5100	12500	8600	----	----
F	---	3600	5700	15800	12500	----	----
G	---	----	6300	----	----	20200	1500
H	---	----	6800	----	----	23000	18500
J	---	----	----	----	----	25000	19500
L	---	----	----	----	----	27000	----
M	---	----	----	----	----	28500	----
N	---	----	----	----	----	30000	----

For rayon cord tires, applicable energy values are 60 percent of those in table.

TABLE III—Endurance Test Schedule

Description	Load range	Test wheel speed (rpm)	Test load: Percent of maximum load rating			Total test revolutions (thousands)
			I 7 hrs.	II 16 hrs.	III 24 hrs.	
Speed-Restricted service						
55 m.p.h.	All	125	66	84	101	352.5
50 m.p.h.	C, D	150	75	97	114	423.0
	E, F, G, H, J, L	100	66	84	101	282.0
35 m.p.h.	All	75	66	84	101	211.5
Motorcycle	All	250	[1]100	[2]108	117	510.0
All others	A, B, C, D,	250	[1]75	[2]97	114	510.0
	E	200	70	88	106	564.0
	F	200	66	84	101	564.0
	G	175	66	84	101	493.5
	H, J, L, N	150	66	84	101	423.0

[1] 4 hours for tire sizes subject to high speed requirements (S6.3)

[2] 6 hours for tire sizes subject to high speed requirements (S6.3)

whether the tire has worn to a tread depth of one-sixteenth of an inch. Tires with 12-inch or smaller rim diameter shall have at least three such treadwear indicators. Motorcycle tires shall have at least three such indicators which permit visual determination that the tire has worn to a tread depth of one-thirty-second of an inch.

S6.5 Tire marking. Except as specified below, each tire shall be marked on each sidewall with the information specified in paragraphs (a) through (j) of this section. The markings shall be placed between the maximum section width (exclusive of sidewall decoration or curb ribs) and the bead on at least one sidewall [unless the maximum section width of the tire is located in an area which is not more than one-fourth of the distance from the bead to the shoulder of the tire. If the maximum section width falls within that area, the markings shall appear between the bead and a point one-half the distance from the bead to the shoulder of the tire, on at least one sidewall. (50 F.R. 10773—March 18, 1985. Effective: May 2, 1985)] The marking shall be in letters and numerals not less than 0.078 inches high and raised above or sunk below the tire surface not less than 0.015 inches, except that the marking depth shall be not less than 0.010 inches in the case of motorcycle tires. The tire identification and the DOT symbol labeling shall comply with Part 574 of this chapter. Markings may appear on only one sidewall and the entire sidewall area may be used in the case of motorcycle tires and recreational, boat baggage, and special trailer tires.

(a) The symbol DOT, which shall constitute a certification that the tire conforms to applicable Federal motor vehicle safety standards. This symbol may be marked on only one sidewall.

(b) The tire identification number required by Part 574 of this chapter. This number may be marked on only one sidewall.

(c) The tire size designation as listed in the documents and publications designated in S5.1.

(d) The maximum load rating and corresponding inflation pressure of the tire, shown as follows:

(mark on tires rated for single and dual load)
Max load single ________ lbs at ________ psi cold
Max load dual _________ lbs at _________ psi cold
(Mark on tires rated only for single load)
Max load____________ lbs at____________ psi cold

(e) The speed restriction of the tire, if 55 mi/h or less, shown as follows:

Max speed _________ mph

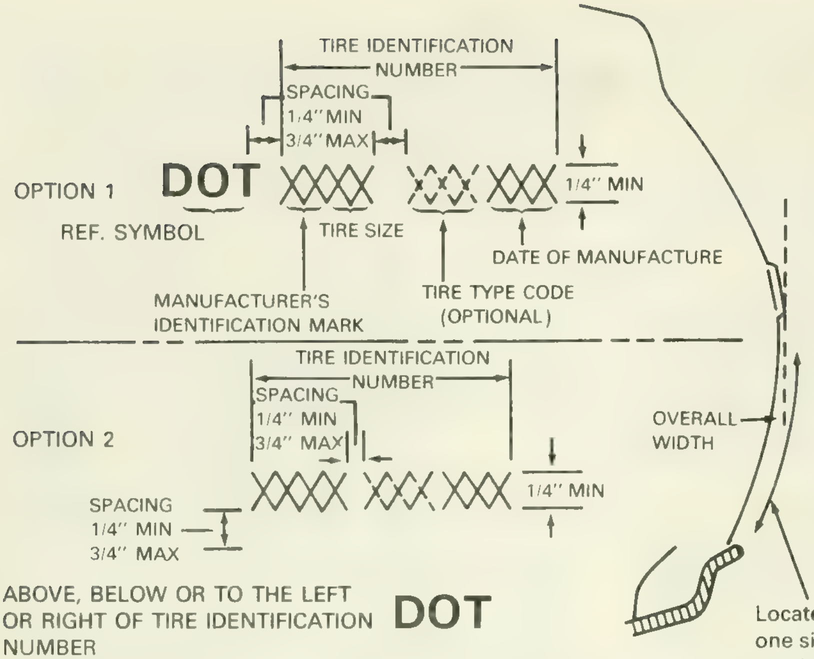
(f) The actual number of plies and the composition of the ply cord material in the sidewall, and, if different, in the tread area.

(g) The words "tubeless" or "tube type" as applicable.

(h) The word "regroovable" if the tire is designed for regrooving.

(i) The word "radial" if a radial tire.

(j) The letter designating the tire load range.


OPTION 1
DOT
XXXX
XXX
XXX
TIRE IDENTIFICATION NUMBER
SPACING 1/4" MIN 3/4" MAX
1/4" MIN
REF. SYMBOL
TIRE SIZE
DATE OF MANUFACTURE
MANUFACTURER'S IDENTIFICATION MARK
TIRE TYPE CODE (OPTIONAL)
OPTION 2
TIRE IDENTIFICATION NUMBER
SPACING 1/4" MIN 3/4" MAX
OVERALL WIDTH
1/4" MIN
SPACING 1/4" MIN 3/4" MAX
ABOVE, BELOW OR TO THE LEFT OR RIGHT OF TIRE IDENTIFICATION NUMBER
DOT

- 5/32" LETTERING FOR TIRES OF LESS THAN 6.00 INCH CROSS SECTION WIDTH AS WELL AS THOSE LESS THAN 13" BEAD DIAMETER MAY BE USED

Notes:

1. Tire identification number shall be in Futura Bold, Modified Condensed or Gothic characters permanently molded (0.020 to 0.040" deep, measured from the surface immediately surrounding characters) into or onto tire at indicated location on one side. (See Note 4)
2. Groups of symbols in the identification number shall be in the order indicated. Deviation from the straight line arrangement shown will be permitted if required to conform to the curvature of the tire.
3. When Type Code is omitted, or partially used, place Date of Manufacture in the unused area.
4. Other print type will be permitted if approved by the administration.

Locate all required labeling in lower segment of one sidewall between maximum section width and bead so that data will not be obstructed by rim flange, unless maximum section width falls between the bead and one-fourth of the distance from the bead to the shoulder of the tire. For tires where the maximum section width falls in that area, locate all required labeling between the bead and one-half the distance from the bead to the shoulder so that data will not be obstructed by rim flange.

Figure 1. Identification Number for New Tires

S6.6 Maximum load rating. If the maximum load rating for a particular tire size is shown in one or more of the publications described in S5.1(b), each tire of that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing published ratings for the same tire size designation, not less than the lowest published maximum load rating for the size designation.

S7. Test procedures.

S7.1 General conditions.

S7.1.1 The tests are performed using an appropriate new tube, tube valve and flap assembly (as required) that allows no loss of air for testing of tube-type tires under S7.2, S7.3, and S7.4, and tubeless tires under S7.3.

S7.1.2 The tire must be capable of meeting the requirements of S7.2 and S7.4 when conditioned at any ambient temperature up to 100° F. for 3 hours before the test is conducted, and with an ambient temperature maintained at any level up to 100° F. during all phases of testing. The tire must be capable of meeting the requirements of S7.3 when conditioned at any ambient temperature up to 70° F. for 3 hours before the test is conducted.

S7.2 Endurance. (a) Mount the tire on a model rim assembly and inflate it to the inflation pressure corresponding to the maximum load rating marked on the tire. Use single maximum load value when the tire is marked with both single and dual maximum load.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a) immediately before mounting the tire rim assembly.

(c) Mount the tire-rim assembly on an axle and press it against a flat-faced steel test wheel that is 67.23 inches in diameter and at least as wide as the tread of the tire.

(d) Apply the test load and rotate the test wheel as indicated in Table III for the type of tire tested conducting each successive phase of the test without interruption.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

S7.3 Strength. (a) Mount the tire on a model rim assembly and inflate it to the pressure corresponding to the maximum load, or maximum dual load where there is both a single and dual load marked on the tire. If the tire is tubeless, a tube may be inserted to prevent loss of air during the test in the event of puncture.

(b) After conditioning the tire-rim assembly in accordance with S7.1.2, adjust the tire pressure to that specified in (a).

(c) Force a cylindrical steel plunger, with a hemispherical end and of the diameter specified in Table I for the tire size, perpendicularly into a raised tread element as near as possible to the centerline of the tread, at a rate of 2 inches per minute, until the tire breaks or the plunger is stopped by the rim.

(d) Record the force and the distance of penetration just before the tire breaks, or if it fails to break, just before the plunger is stopped by the rim.

(e) Repeat the plunger application at 72° intervals around the circumference of the tire, until five measurements are made. However, in the case of tires of 12-in rim diameter or less, repeat the plunger application at 120° intervals around the circumference of the tire, until three measurements are made.

(f) Compute the breaking energy for each test point by the following formula:

$$W = \frac{FP}{2}$$

where

W = Breaking energy

F = Force in pounds, and

P = Penetration in inches.

(g) Determine the average breaking energy value for the tire by computing the average of the values obtained in accordance with (f).

S7.4 High speed performance.

(a) Perform steps (a) through (c) of S7.2.

(b) Apply a force of 88 percent of the maximum load rating marked on the tire (use single maximum load value when the tire is marked with both single and dual maximum loads), and rotate the test wheel at 250 rpm for 2 hours.

(c) Remove the load, allow the tire to cool to 100° F., and then adjust the pressure to that marked on the tire for single tire use.

(d) Reapply the same load, and without interruption or readjustment of inflation pressure, rotate the test wheel at 375 rpm for 30 minutes, then at 400 rpm for 30 minutes, and then at 425 rpm for 30 minutes.

(e) Immediately after running the tire the required time, measure the tire inflation pressure. Remove the tire from the model rim assembly, and inspect the tire.

38 F.R. 31299
November 13, 1973

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71–19; Notice 3)

This notice establishes a new Federal Motor Vehicle Safety Standard No. 120, *Tire selection and rims for motor vehicles other than passenger cars*, 49 CFR 571.120, and amends 49 CFR Part 567, *Certification*. The new standard specifies tire and rim selection requirements for multipurpose passenger vehicles (MPV's), trucks, buses, trailers, and motorcycles, and marking requirements for rims for use on these vehicles. It also adds tire and rim matching information to the items required to appear on such vehicles' certification labels. The amendment to Part 567 makes that regulation consistent with the new standard. The notice is based on proposals which were published August 3, 1971 (36 F.R. 14273) and June 3, 1974 (39 F.R. 19505).

The standard requires new vehicles (other than passenger cars, which are the subject of Standard No. 110) to be equipped with tires that comply with either Standard No. 109, *New Pneumatic Tires—Passenger Cars*, or Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars*. The tires must be fitted to rims which have been designated by the tire manufacturer, in accordance with S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as suitable for use with those tires. The designations are made by listing the tire-rim matching information in one of seven industry-maintained publications or by furnishing this information to dealers of the manufacturer's tires, to any person upon request, and to the NHTSA.

Each axle must be equipped with tires the sum of whose load ratings is not less than that axle system's Gross Axle Weight Rating (GAWR). In certain situations, discussed below, a vehicle may be equipped with used tires of adequate load rating that were originally manufactured to comply with Standard No. 119. Adequacy is determined as follows: the sum of the maximum load ratings of the tires must be equal to or greater than the GAWR which is specified on the Part 567 certification label, with an exception discussed below. If the certification label lists more than one GAWR-tire combination for the axle, the sum of the tires' maximum load ratings must meet or exceed the GAWR that corresponds to the tires' size designation. If more than one combination is listed, but the size designation of the actual tires on the vehicle is not among those listed, then the sum of the load ratings must simply meet or exceed the lowest GAWR which does appear.

Rims must be marked with five items of information: the size designation (and, in the case of multipiece rims, the type designation), an indication of the source of the rim's nominal dimensions, and the DOT symbol must appear on the weather side, while identification of the manufacturer and date of manufacture may appear at any place on the rim's surface. The standard does not explicitly require that a rim conform to its published dimensions. If a rim's deviation from these nominal dimensions is so great that a safety hazard is presented, however, the defect notification and remedy provisions of the National Traffic and Motor Vehicle Safety Act of 1966, as amended, provide authority to deal with the hazard.

To reduce the possibility of confusion and to minimize the number of characters stamped on the rim, the standard establishes a set of code letters to indicate the source of the rim's nominal dimensions. "T", "E", "J", "D", "M", "B", and "S" indicate the industry publications listed in Standards Nos. 109 and 119, while "N" indicates

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The standard requires new vehicles (other than passenger cars, which are the subject of Standard No. 110) to be equipped with tires that comply with either Standard No. 109, *New Pneumatic Tires—Passenger Cars*, or Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars*. The tires must be fitted to rims which have been designated by the tire manufacturer, in accordance with S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as suitable for use with those tires. The designations are made by listing the tire-rim matching information in one of seven industry-maintained publications or by furnishing this information to dealers of the manufacturer's tires, to any person upon request, and to the NHTSA.

Each axle must be equipped with tires the sum of whose load ratings is not less than that axle system's Gross Axle Weight Rating (GAWR). In certain situations, discussed below, a vehicle may be equipped with used tires of adequate load rating that were originally manufactured to comply with Standard No. 119. Adequacy is determined as follows: the sum of the maximum load ratings of the tires must be equal to or greater than the GAWR which is specified on the Part 567 certification label, with an exception discussed below. If the certification label lists more than one GAWR-tire combination for the axle, the sum of the tires' maximum load ratings must meet or exceed the GAWR that corresponds to the tires' size designation. If more than one combination is listed, but the size designation of the actual tires on the vehicle is not among those listed, then the sum of the load ratings must simply meet or exceed the lowest GAWR which does appear.

Rims must be marked with five items of information: the size designation (and, in the case of multipiece rims, the type designation), an indication of the source of the rim's nominal dimensions, and the DOT symbol must appear on the weather side, while identification of the manufacturer and date of manufacture may appear at any place on the rim's surface. The standard does not explicitly require that a rim conform to its published dimensions. If a rim's deviation from these nominal dimensions is so great that a safety hazard is presented, however, the defect notification and remedy provisions of the National Traffic and Motor Vehicle Safety Act of 1966, as amended, provide authority to deal with the hazard.

To reduce the possibility of confusion and to minimize the number of characters stamped on the rim, the standard establishes a set of code letters to indicate the source of the rim's nominal dimensions. "T", "E", "J", "D", "M", "B", and "S" indicate the industry publications listed in Standards Nos. 109 and 119, while "N" indicates an independent listing with tire dealers and the NHTSA. The proposed requirement that the marking indicate the date of the publication has not been adopted because it does not appear necessary. The standard does not require manufacturers to be identified with a code number assigned by the NHTSA, because no action has been taken on the proposal published in the Federal Register on June 7, 1973 (38 F.R. 14968). The rim manufacturer is free to use his name, trademark, or a symbol of his choice. Because a rim's maximum load rating may be limited by its disc, this standard does not require that the maximum load rating be marked. The rim's maximum inflation pressure, while not affected by the choice of disc, is potentially misleading without additional marking of the disc. These rim markings are being considered in conjunction with further NHTSA rulemaking activity concerning wheels.

Several commenters objected to the proposed requirement of a tire-rim information label, separate from and adjacent to the certification label required by Part 567. Upon consideration of these comments, the NHTSA agrees that a separate placard is unnecessary. GVWR and GAWR are already required to appear on the certification label. If the required manufacturer exercises his option of listing more than one GVWR-GAWR combination, he is already required to indicate the proper tire size designations after each weight rating. Standard No. 120 further requires, for vehicles other than passenger cars, the following information to appear after each weight rating and tire size designation listed on the certification label: rim size designation, cold inflation pressure for the tires, and speed restriction (if any) for the tires. This information is now required to appear even when only one GVWR-GAWR combination is listed. The Part 567 label is thus expanded to include the information that would have appeared on the separate label described in S5.4 of the proposed Standard No. 120.

Many commenters pointed to the large number of possible axle-tire-rim combinations and suggested that the information label would be too large and confusing. Some discussed the vehicle manufacturer's difficulty in ensuring that the required information appear, given the common practice of changing tires and rims after a new vehicle has been shipped to a dealer. These commenters appear to have misunderstood the various proposed and existing requirements. Part 567 does not, in its prior form or as amended today, require a listing for more than one GVWR-GAWR-tire combination. Further, while S5.1.2 of Standard No. 120 requires the tires with which a new vehicle is equipped to be of adequate load rating for the GAWR, and while S5.3 requires an indication of tires adequate for the GAWR, there is no requirement that the actual tires be listed on the certification label. The tire information on that label is intended as a guide which tells the user what replacement tires, *as a minimum*, are appropriate for the listed GAWR and what rims are appropriate for those tires.

Guerdon Industries, Inc., objected to the requirement that vehicles be restricted to the load limits molded on tire sidewalls. The pointed to the mobile home industry's practice of loading tires to 150 percent of their load ratings, and argued that this practice should be permitted to continue. Examination of data compiled by the Bureau of Motor Carrier Safety, however, shows that from 1969 to 1972 (the most recent years for which figures are available), tires accounted for 18.0 percent of reported mobile home accidents. The NHTSA therefore rejects the proposition that such overloading does not present a safety hazard. There is no exception to the requirement that all vehicles be equipped with tires of adequate load rating.

Some commenters requested that tire overloading be permitted under restricted speed conditions. These commenters appear to have misunderstood the scope of the standard. Vehicles-in-use are regulated by the States and by the Bureau of Motor Carrier Safety. Standard No. 120 does not prohibit the overloading of tires in speed-restricted service, or otherwise regulate the use of tires or vehicles. The GVWR and GAWR information on the certification label is based on unrestricted service.

The formula described above for tire selection is subject to an exception for MPV's, trucks, buses, and trailers which are equipped with passenger car tires. The combined maximum load rating of the passenger car tires on an axle must be equal to or greater than 110 percent of the axle's GAWR. Some comments supported this exception as it was proposed. Others suggested that passenger car tires be permitted on such vehicles without the 110% factor, while the RMA and others argued that passenger car tires should not be permitted on trailers at all. The NHTSA rejects the argument that the 110% correction factor is unnecessary. Because non-passenger-car service on the average puts greater stresses on a tire (for example, trucks and trailers are driven at or near their maximum rated loads more often than passenger cars), a given load rating for a Standard No. 109 tires does not have the same meaning as the identical load rating for a Standard No. 119 tire. Conversely, the NHTSA has found no evidence that passenger car tires are inadequate for trailer service when the load correction factor is applied. The 110 percent factor is therefore adopted as proposed.

As proposed, the standard included an exception to the requirement that new vehicles be equipped with new tires conforming to Standard No. 109 or 119. Used tires were to be permitted on a truck, bus, or trailer (other than a mobile structure trailer) under the following conditions: the tires were originally manufactured to comply with Standard No. 119; they were of adequate load rating; they were owned or leased by the purchaser; and they were installed on the new vehicle at its place of manufacture at the purchaser's request. Comments on this exception were generally favorable, although one mobile home manufacturer objected to the exclusion of mobile structure trailers. The exception was intended to accommodate commercial delivery practices in the truck, bus, and trailer industry. While fleets which lease tires on a mileage-contract basis or which install their own used tires on new vehicles are in a good position to know the condition of these tires, the mobile home purchaser has no knowledge of the history of used tires installed on his vehicle. The proposed exception to the new tire requirement is therefore not extended to include all mobile structure trailers. It is, however, extended to include those delivered to the purchaser by a motor carrier, because a motor carrier (who is subject to Bureau of Motor Carrier Safety regulations) can be expected to be more familiar with tire safety needs than a typical purchaser. To clarify the proposed language, " originally manufactured to comply with Standard No. 119," the words "as evidenced by the DOT symbol" have been added to the text of the standard.

Several commenters pointed out that certain vehicles are designed for non-uniform side to side loading, and suggested that the proposed method of determining the necessary tire load rating from the GAWR (dividing GAWR by the number of wheel positions on the axle) is inadequate for such vehicles. These commenters argued that tire load rating should be based on the maximum wheel load, rather than on the GAWR. The standard issued today does not specify the maximum load rating to be exceeded by each tire on any given axle. Instead, it requires the sum of those load ratings to meet or exceed the GAWR. The manufacturer of an asymmetrically designed vehicle can therefore equip an axle with tires of differing load ratings. The NHTSA agrees that each tire should be capable of carrying its maximum expected wheel load. At this time, however, the NHTSA considers its defect authority, combined with the new standard, adequate to ensure that vehicles are equipped with such tires.

Definitions have been added to clarify the meaning of "rim base," "rim size designation," "rim type designation," "rim diameter," "rim width," and "weather side." Definitions suggested for other terms have not been included in the standard because the meanings have been found to be widely understood or self evident.

Many comments pointed out problems with a single effective date. For example, for marked rims to be available to vehicle manufacturers in time, and interval is necessary between the effective dates for the rim marking requirement and the requirement that vehicles be equipped with rims that comply with the standard. Similarly, to require all used tires, otherwise permitted by S5.1.3 to have originally been manufactured to comply with Standard No. 119 would, without a delay in the effective date, cause the waste of pre-Standard No. 119 tires of adequate load-carrying capacity. Accordingly, a staggered system of effective dates is established as set out below.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended. . . .

Effective dates: For the amendment to Part 567: September 1, 1976. For Standard No. 120: August 1, 1976, for the rim marking requirements (S5.2), and September 1, 1976, for the remaining requirements except as otherwise provided in the standard.

(Secs. 103, 112, 114, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on January 19, 1976.

James B. Gregory
Administrator

41 F.R. 3478
January 23, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71–19; Notice 4)

This notice delays the effective dates of certain requirements of Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars, and of the conforming amendment to 49 CFR Part 567, Certification, that was issued along with the standard. Its purpose is to permit manufacturers to avoid the burden of preparation for compliance with requirements that the NHTSA has determined should be amended. There is no delay, however, in the standard's basic tire and rim selection requirements, which become effective September 1, 1976.

Standard No. 120 (49 CFR § 571.120) was issued on January 19, 1976 (41 FR 3478; January 23, 1976; Notice 3). It specifies requirements for tire and rim selection, rim marking, and the provision of tire and rim information on vehicle certification labels. Part 567, the certification regulation, was amended in the same Federal Register notice, to accommodate the additional labeling.

Manufacturers are expected to begin preparations for compliance with a standard at the time a final rulemaking notice is issued. Lead times are established in accordance with this expectation, despite the possibility of future amendments. Fifteen petitions for reconsideration of Standard No. 120 have been received. From the petitions and other information available to this agency, the NHTSA has determined that certain provisions of the standard should be amended. However, the agency finds it impracticable to respond to the petitions by May 24, 1976, the date by which a response would be expected under its policy regarding such responses (49 CFR Part 553, Appendix). The agency plans to respond to the petitions not later than July 1, 1976. Without a delay of certain effective dates, manufacturers would be forced to make preparation for compliance with requirements that will, in all likelihood, be changed.

Accordingly, this notice changes from September 1, 1976, to September 1, 1977, the effective date of the requirement, found in S5.3, that certain information appear on a vehicle's certification label. The effective date of the conforming amendment to Part 567, *Certification*, is similarly changed to September 1, 1977. The effective date of S5.2, *Rim Marking*, is changed from August 1, 1976, to August 1, 1977. The date by which vehicles must be equipped with rims that are marked in accordance with the standard, which is presently specified in S5.1.1 as March 1, 1977, is changed to September 1, 1979. The NHTSA is considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available.

Manufacturers should note that, apart from the changed effective date for the requirement in S5.1.1 that vehicles be equipped with properly marked rims, there is no delay in the September 1, 1976, effective date of the standard's basic requirement, S5.1 (*Tire and Rim Selection*).

The symbol "DOT" is required by S5.2(c) to appear on every non-passenger-car rim manufactured on or after the effective date of the rim marking requirements, as a certification by the manufacturer of the rim that it complies with all applicable Federal motor vehicle safety standards. Several manufacturers have requested permission to begin stamping the symbol on rims that otherwise comply with the standard, before that effective date. In the past, the NHTSA has in similar situations taken the position that such use of the DOT symbol to indicate "anticipatory compliance" would necessarily be a false or misleading certification, because no standard would in fact be in effect at the time of its use.

The agency has determined that a limited relaxation of this principle will not adversely affect its enforcement authority, yet will both foster early compliance with impending requirements and ease manufacturer's difficulties in transition to new production procedures. Accordingly, the NHTSA will not consider the use of the symbol "DOT" on an item of motor vehicle equipment that is not subject to any applicable and effective standard to be "false or misleading" if the following conditions are met: (i) there has, as of the date of manufacture of the item of equipment, been issued as a final rule a Federal motor vehicle safety standard to which the item of equipment would, but for that date's being earlier than the standard's effective date, be subject; and (ii) the item of equipment meets all requirements set out in the standard as most recently published before the date of manufacture of the equipment. The NHTSA will continue to consider other, unauthorized uses of the symbol to be "false or misleading in a material respect" within the meaning of Section 108(a)(1)(C) of the National Traffic and Motor Vehicle Safety Act of 1966, as amended (15 U.S.C. 1398(a)(1)(C)).

This interpretation will permit the requested stamping that is discussed above. It will not permit the restamping, requested by several manufacturers, of previously manufactured rims that are in stock. These latter requests, however, are no longer of practical significance because of the other actions taken in this notice.

In consideration of the foregoing, the effective date of the amendment to 49 CFR Part 567, *Certification*, that was published on January 23, 1976 (49 FR 3478) is changed from September 1, 1976, to September 1, 1977, and changes are made to 49 CFR § 571.120 (Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*) . . . .

Effective date: These changes in the text of the Code of Federal Regulations should be made immediately.

(Sec. 103, 112, 114, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on April 29, 1976.

Robert L. Carter
Acting Administrator

41 F.R. 18659
May 6, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71-19; Notice 5)

This notice amends Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars (49 CFR 571.120), to permit until February 28, 1977, the equipping of new non-passenger-car vehicles with tires that do not meet certain tire labeling requirements but that otherwise meet all requirements of Standard No. 119 (New Pneumatic Tires for Vehicles Other Than Passenger Cars).

Standard No. 120 was issued on January 19, 1976 (41 FR 3478; January 23, 1976; Docket No. 71-19, Notice 3). It specifies tire and rim selection requirements for multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and marking requirements for rims for use on these vehicles. It also adds tire and rim matching information to the items required to appear on such vehicles' certification labels. A staggered sequence of effective dates was set out in Notice 3, beginning with September 1, 1976.

In Notice 4 (41 FR 18659; May 6, 1976), the NHTSA delayed several of these effective dates, to permit manufacturers to defer preparation for compliance with the corresponding requirements pending action on petitions for reconsideration of Notice 3. The NHTSA expects to respond to these petitions in the near future. Notice 4 did not, however, change the basic September 1, 1976, effective date of the tire and rim selection requirements of S5.1. Beginning on that date, S5.1.1 of Standard No. 120 would require, with an exception that is not relevant here, new non-passenger-car vehicles to be equipped with tires that meet either Standard No. 109 (which is applicable to passenger car tires) or Standard No. 119 (which is applicable to all other tires). The practical effect is to require most such vehicles to be equipped with Standard 119 tires, because Standard 109 tires are appropriate for use only on certain non-passenger-car vehicles.

Standard No. 119 became effective on March 1, 1975, with an option to delay implementation of its labeling requirements until March 3, 1975 (see 40 FR 8188; February 26, 1975).

The NHTSA has received petitions for rulemaking from International Harvester (IH) and Ford Motor Company. International Harvester indicated that, in anticipation of the recent strike against the nation's four largest tire manufacturers, it had accumulated an excess inventory of "pre-Standard 119 tires." IH stated that these tires meet the performance requirements of Standard No. 119 but not the labeling requirements. It petitioned for a six-month delay of the September 1, 1976, effective date of Standard No. 120's tire selection requirements, to permit the orderly depletion of this inventory.

Ford's petition focused on the difficulty, due to the strike, in obtaining in the near future sufficient quantities of tires that comply fully with Standard No. 119. Ford indicated that there are similar pre-Standard 119 tires available to it. It petitioned for an amendment to Standard No. 120 to permit the use of such insufficiently labeled tires.

The NHTSA believes that the approach suggested by Ford, because it will provide the necessary relief while preserving the required level of performance, is preferable to a simple delay of the September 1, 1976, effective date. Safety of performance of such tires or of vehicles equipped with them is thus not a major issue. The NHTSA has determined that, while granting the relief requested by these petitions may temporarily make enforcement by this agency more difficult and may postpone the availability of certain tire labeling information to users of new vehicles subject to Standard No. 120, the avoidance of a serious disruption in the truck manufacturing process in this situation is appropriate and in the public interest. Accordingly, this notice adds a new section to Standard No. 120 that permits, for six months, the use of tires that are not properly labeled but otherwise meet all requirements of Standard No. 119.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200; April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. This action imposes no new economic or environmental costs. It creates the benefit of avoidance of serious economic disruption. In light of this benefit and the fact that the required level of tire performance is preserved, any loss in safety benefits would be insignificant in this case.

Because of the imminent effective date of a requirement which would otherwise lead to serious economic disruption, the NHTSA for good cause finds that notice and public procedure on this amendment are impracticable and contrary to the public interest.

In consideration of the foregoing, 49 CFR 571.120 (Standard No. 120, Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars) is amended by the addition of a new section. . . .

Effective date: August 27, 1976. Because this amendment relieves a restriction, it is found, for good cause shown, that an immediate effective date is in the public interest.

(Secs. 103, 112, 114, 119, 201, 202, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1401, 1403, 1407, 1421, 1422); delegation of authority at 49 CFR 1.50.)

Issued on August 27, 1976.

Robert L. Carter
Acting Administrator
41 F.R. 37115
September 2, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 71–19; Notice 6; Docket No. 75–32; Notice 2)

This notice responds to petitions for reconsideration of the newly established Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*, by amendments to the standard in the areas of tire and rim selection, rim making, and tire label information. A minor amendment of Part 567, "Certification," is also made. In addition, the decision that the agency no longer regulates mobile structure trailers (mobile homes) is also set forth, along with appropriate conforming amendments of Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and § 571.3, *Definitions*, of Part 571.

Standard No. 120 (49 CFR 571.120) establishes that multipurpose passenger vehicles (MPV's), trucks, buses, motorcycles, and trailers shall be equipped with tires and rims that are adequate to support the fully loaded vehicle under contemplated operating conditions. The legislative history of the National Traffic and Motor Vehicle Safety Act (the Act) (15 U.S.C. 1381, et seq.) and § 202 of that Act establish Congress' concern that motor vehicles could be equipped with inadequate tires and that regulation would be necessary to protect against this problem:

> Sec. 202. In standards established under title I of this Act the Secretary shall require that each motor vehicle be equipped by the manufacturer or by the purchaser thereof at the time of the first purchase thereof in good faith for purposes other than resale with tires which meet the maximum permissible load standards when such vehicle is fully loaded with the maximum number of passengers it is designed to carry and a reasonable amount of luggage.

Standard No. 120 was promulgated January 19, 1976 (41 FR 3478, January 26, 1976), and 17 petitions for reconsideration of particular provisions were filed by vehicle, tire, and rim manufacturers, and by trade associations representing these manufacturers. In view of the length of time that has been taken to respond to these petitions for reconsideration, the effective dates for implementation of several of the standard's provisions were delayed (41 FR 18659, May 6, 1976) (41 FR 36657, August 31, 1976). The standard's basic provision for tire and rim selection (S5.1) was not delayed and became effective September 1, 1976.

Tire and rim selection. The primary effect of Standard No. 120 is fulfillment of § 202 of the Act by specification of the minimum load-carrying characteristics of tires on motor vehicles not already subject to the passenger car tire and rim selection requirements of Standard No. 110, *Tire Selection and Rims*, of Part 571. The rim selection requirements of the standard are limited (use of a rim designated as suitable by the tire manufacturer for use with its product; use of "DOT" labeled rims on and after September 1, 1979) in anticipation of more comprehensive regulation of rims as part of an upcoming wheel standard.

Tire selection consist of two elements: With one exception, each vehicle must be equipped with tires that comply with Standard No. 119, *New Pneumatic Tires for Vehicles Other Than Passenger Cars* (or Standard No. 109, *New Pneumatic Tires*), and the load rating of the tires on each axle of the vehicle must together at least equal the gross axle weight rating (GAWR) for that axle. The term GAWR is defined in § 571.3 of Part 571 as ". . . the value specified by the vehicle manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces." The GAWR concept formalizes the decision each manufacturer makes about the load-bearing ability of the tires, rims, axle, brakes, and suspension components (at a minimum) chosen to support and control the loaded vehicle.

The Truck Equipment Body Distributors Association (TEBDA) questioned the requirement that, with one exception, each vehicle subject to Standard No. 120 be equipped with tires that conform to Standard No. 119 (or Standard No. 109). TEBDA's March 17, 1976, letter concerned certification of trucks equipped for agricultural service with Goodyear "Terra-Tires." The "Terra-Tire" is one example of tires that are placed on specialized motor vehicles which operate both on and off the highway. The tires are specially designed and are unable to be certified to either of the tire performance standards.

Section S5.1.1 specifies that "each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirement of [the tire] standard[s]. . . ." This language is intended to exclude from the requirement for Standard 119 (or 109) tires of those vehicles which the manufacturer (or person later in the chain of distribution) decides to equip with tires other than "tires for highway service." The decision is left with the manufacturer at this time in view of the absence of data that demonstrates problems in the use of these tires that would justify their elimination. Any pattern of accident occurrence that points to unsafe utilization of non-highway service tires would presumably constitute a safety-related defect and could lead to revision of Standard No. 120 to regulate them. At this time, the answer to TEBDA is that the tire selection requirements of S5.1.1 (and S5.1.2 as a logical extension of S5.1.1) would not apply to a vehicle equipped with non-highway service tires. It is emphasized that this exclusion from Standard No. 120 bears no direct relationship to the determination of whether a particular vehicle qualifies as a "motor vehicle" as that term is defined in § 102(3) of the Act.

The second requirement for tire selection (S5.1.2) is that "[t]he sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system. . . ." Comparable further specification exists when multiple ratings appear on the certification label, or the tires used on the vehicle are not listed on the certification label.

Because no petition directly raised objections to the requirements of S5.1.2, the agency first addresses issues raised in a separate and outstanding NHTSA proposal dealing with tire choice and its relationship to GAWR. The action (Definition of "Gross Axle Weight Rating," 40 FR 58152, December 15, 1975) proposed that the GAWR determination be based on, among other things, the vehicle's maximum attainable speed or the maximum load rating of the tire established by the tire manufacturer at 60 mph, whichever is lower. The proposed modification was intended to reflect the industry practice of assigning (in most cases) and labeling (in accordance with Standards 119 and 109) a tire's basic load-carrying capabilities in recognition of the unrestricted highway speeds to which it is normally exposed. This formalization of GAWR determination was intended to prevent manufacturers from assigning higher capabilities to tires than their 60-mph ratings, based on arbitrarily low speeds.

Most comments supported the GAWR proposal, although several truck manufacturers asked that the term "maximum attainable speed" be specifically defined as it is elsewhere in NHTSA regulations. Ford Motor Company opposed the proposed change in the definition of GAWR as an arbitrary selection of only one of the many criteria that enter into the determination of GAWR. The company suggested that other means exist to prevent assignment of arbitrary GAWR's based on tire ratings other than those established at 60 mph and so labeled on the tire sidewall.

The NHTSA agrees with Ford and notes that the "other means" to regulate this practice exist in the tire selection requirements of S5.1.2 of Standard No. 120. At the time of the GAWR proposal, Standard No. 120 had not been made final. Since its implementation on September 1, 1976, a manufacturer is free to determine GAWR as in the past, but the maximum load ratings (marked on the tire sidewall) of tires on the vehicle must be at least equal the GAWR listed. For this reason, the NHTSA's proposal for amendment of the GAWR definition is considered unnecessary and is therefore withdrawn. Further notice and opportunity for comment will precede any further action on the proposal set forth in that notice.

Several issues were raised in regard to the GAWR proposal that should be addressed for purposes of clarification. The Heavy & Specialized Carriers Conference of the American Trucking Associations (HSCC) cautioned the NHTSA against requiring an "unrestricted speed GAWR" on the Part 567 certification label in view of two State laws (or regulations) that no vehicle can operate on the state highways at gross vehicle weights greater than those listed on the vehicle in accordance with Federal regulations. It is common practice to load some "heavy hauler" vehicles to a gross vehicle weight that exceeds the unrestricted speed ratings of the vehicle tires, because the vehicle's tires are capable of carrying greater weight at reduced speeds.

As issued, Standard No. 120 required that the maximum load ratings of the tires at least equal the GAWR. This effectively limits the GVWR to the sum of these GAWR's (except in the case of semi-trailers). In the agency's view, however, the problem cited by HSCC can be avoided by listing additional GAWR's (calculated for reduced speed operation) at the end of the certification plate following the required data on the label. This practice has been followed by members of the Truck Trailer Manufacturers Association (TTMA) and was confirmed as permissible by the NHTSA in a March 5, 1975, letter to the TTMA. In order to aid resolution of issues that may arise between States that wish to refer to the certification label and operators that wish to continue the additional rating system, the agency hereby makes an interpretive amendment to Part 567 to specify where additional ratings may appear.

Based on this understanding of the relationship between choice of tires under S5.1.2 of Standard No. 120 and the determination of GAWR under § 567.4 of Part 567, a modification of the requirements of Standard No. 120 is justified. In the case of a vehicle that is incapable of the 60-mph speed used by tire manufacturers to establish the maximum load rating that is stamped on the tire sidewall (typically a powered vehicle and not a trailer), it would not be reasonable to require the GAWR's to be strictly limited to the sum of the maximum load ratings of the tires on the vehicle. This is because the vehicle will never achieve the speeds for which maximum load ratings were established. In many cases, provision is made to rate tires for a greater load at the lower (but maximum) speed of which a vehicle is capable. In recognition of this extremely limited specialized situation, the agency amends S5.1.2 to permit installation of tires with reduced speed capabilities in the case of vehicles whose maximum attainable speed is not greater than 50 mph. This amendment is considered to be a technical adjustment of language to fully implement the intent of the final rule as it was established. A separate amendment of § 571.3 is made to establish the basis for determination of a vehicle's maximum attainable speeds.

Volkswagen raised a separate issue concerning the requirement that the sum of maximum load ratings at least equal the GAWR of the axle system. This provision, in the case of an MPV, truck, bus, or trailer that is equipped with passenger car tires, requires that the maximum load ratings on the tires be reduced by approximately 10 percent before calculating the sum. The purpose of this 10-percent reduction in tire rating is to account for the generally harsher treatment (impulse and surge loading in the case of MPV's off-road) to which the tires of a vehicle other than a passenger car are exposed that is not accounted for in passenger car tire ratings. Volkswagen requested data showing that MPV's actually experience more abusive treatment in use.

The MPV category is based in part on the existence of characteristics that make these vehicles less amenable to passenger car standards. If Volkswagen has data indicating that the two categories actually experience identical usage, the NHTSA would prefer to adjust the definition to ensure that these vehicles are subject to all passenger car standards. Until that time, the existing rationale for excusing these vehicles from some passenger car standards dictates the use of higher strength tires.

As earlier noted, the rim selection requirements of Standard No. 120 are not substantial, consisting of a requirement that the rims be listed by the tire manufacturer as suitable for use with its tires, and a requirement that, on and after September 1, 1979, the rims used on a vehicle be labeled as specified in S5.2 of the standard. The September 1, 1979, date for use of labeled rims replaced a March 1, 1977, date that proved impractical in view of large inventories of unlabeled rims that exist and will exist long after rim labeling is begun. In establishing the later effective date, the agency noted that it was considering the possibility of eliminating this requirement entirely, to simplify the phase-in of properly marked rims as they become available. Experience with phase-in of newly regulated equipment in other areas such as tires and brake hoses has demonstrated that the requirement for labeled equipment on and after a particular date can create substantial inventory and potential economic waste problems. In view of experience that the delay of labeling requirements has not substantially impeded certification verification and defect actions, the NHTSA has decided to withdraw the requirement (that appears as the last sentence of S5.1.1). It is noted that withdrawal of this requirement does not affect the requirement of S5.1.2 that rims be listed as suitable by the tire manufacturer for use with the tires with which the vehicle is equipped, or the requirement of S5.2 that rims be labeled with specified information.

Mobile structure trailers. With regard to the applicability of this standard and other standards as a general matter, the NHTSA takes this opportunity to publish in the *Federal Register* its conclusion that enactment of the National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the Mobile Home Act) impliedly repealed this agency's authority to regulate mobile homes. This conclusion was announced in a May 5, 1976, letter to the Department of Housing and Urban Development that stated in relevant part:

> The National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. 5401 et seq.) (the "Mobile Home Act") established within the Department of Housing and Urban Development a comprehensive program for the regulation of mobile homes. We have concluded that one result of that statute's enactment was the implied repeal of the NHTSA's authority with respect to mobile homes. Accordingly, we consider that the enactment has the effect of amending the Vehicle Safety Act's definition of "motor vehicle" to exclude "mobile homes" as the latter term is defined in the Mobile Home Act.

The effect of this conclusion is that tire and rim selection for mobile homes (known as "mobile structure trailers" by the NHTSA) is no longer subject to Standard No. 120 or other regulations issued under authority of the Act. For this reason, references to "mobile structure trailer" in Standard No. 120, Standard No. 108, *Lamps, Reflective Devices, and Associated Equipment*, and the general definitions section of Part 571 (§ 571.3) are deleted.

On the same subject, a May 25, 1976 (and supplementing July 7, 1976), letter from Firestone to the NHTSA asked whether tires manufactured exclusively for mobile homes and tires that are used on mobile homes (although manufactured for other uses) are subject to regulation under the Act. Similar questions were raised as to the status of rims, some of which are designed exclusively for use on mobile homes and some of which are used on mobile homes and other vehicles.

As for tires, Standard No. 109 applies to "tires for use on passenger cars" and Standard No. 119 applies to "tires designed for highway use on [specified motor vehicles]." By these terms, neither standard applies to tires designed exclusively for use on mobile homes. In the case of tires actually used on mobile homes but designed for use also on vehicles subject to the Act, the agency considers such tires to be subject to the standards' requirements because they constitute motor vehicle equipment as that term is defined in § 102(4) of the Act.

As for rims, Standard No. 110 contains specifications only for rims that equip passenger cars and therefore contains no requirements that would directly require performance of a rim that was installed on a mobile home. Standard No. 120 applies to rims "for use on" MPV's, trucks, buses, motorcycles, and trailers (other than mobile structure trailers) and therefore would not apply to rims designed exclusively for use on mobile homes. In the case of rims designed for use on any of the motor vehcile types listed, the NHTSA would consider Standard No. 120's requirements applicable, and labeling in accordance with S5.2 would be required.

Rim marking. The second requirement of Standard No. 120 is an equipment requirement specifying five items of information (six in the case of multipiece wheels) that must appear on any rim for use on MPV's, trucks, buses, trailers, or motorcycles. The requirements for location of the information varies according to the type of information and whether the rim is part of a single or multipiece wheel. In answer to a question raised by Kelsey-Hayes and Motor Wheel, it is confirmed that these marking requirements have no bearing on the use of the rim on passenger cars, except as future labeling requirements in Standard No. 110 might prohibit one or more of the items required by S5.2. This eventuality is considered to be extremely unlikely.

Based on a comprehensive review of the petitions for reconsideration, the agency has decided that some requested modifications in labeling requirements are justified. The Japanese Automobile Manufacturers Association and Suzuki asked that required labeling be permitted to be embossed as well as impressed on the rim. Volkswagen (and representatives from Motor Wheel and Goodyear in a February 4, 1976, meeting with the NHTSA) asked that rim labeling be permitted on the disc portion of a single-piece wheel. The agency considers these suggestions to constitute justifiable options that would not diminish the level of motor vehicle safety represented by the standard, and the standard is accordingly amended.

Motor Wheel requested amendment of the standard to state that labeling of multipiece rims is permitted in the bolt hold area. The agency does not consider the addition of advisory information to be a desirable drafting practice because the mention of bolt hole locations would imply that some restriction on location exists when in fact it does not. In answer to another question from Motor Wheel, more than one "rim type designation" on rim components of a multipiece wheel is permitted by the standard.

Motor Wheel and Goodyear also asked if numbers that contain decimals or "trailing zeroes" e.g., 7.50) could be shortened by deleting the decimal and "trailing zero." The agency believes that abbreviation by dropping the zero will not be confusing and amends the standard to include an example of such abbreviation. Confusion would result from dropping the decimal.

In response to a request by Motor Wheel and Budd Company for a specific provision in S5.1.2 that the marking requirements only apply to newly manufactured wheels, the agency notes the general applicability statement in § 571.7, governing the applicability of all standards found in Part 571, states that ". . . each standard set forth in subpart B of this part applies according to its terms to all motor vehicles or items of motor vehicle equipment the manufacture of which is completed on or after the effective date of the standard." Thus, the standard only applies to rims manufactured on or after the effective date of S5.2.

Manufacturers asked for several revisions of the marking requirements which the agency has considered and concludes are unjustified. This discussion treats the requests in the order that the markings in question appear in S5.2.

With regard to the requirement for marking with a designation that indicates the source of the rim's published dimensions (S5.2(a)), Daido Corporation asked whether the Japanese Industrial Standards' symbol (a stylized combination of the letters J, I, and S) or the letters "JIS" would meet the requirements of S5.2(a)(3) for use of letter "J." The agency interprets its labeling requirements as strictly as any other portion of its requirements and concludes that neither "JIS" nor the JIS symbol would conform to the requirement of S5.2(a)(3). In response to a similar request by Volkswagen to permit "DIN" in place of "D," the agency has considered the idea of permitting the manufacturer the option of a choice of designations, and concludes they are undesirable in the interests of maintaining uniformity and comprehension.

Grove Manufacturing suggested that the single letter designations of "D" and "E" could be mistaken for the load ranges that appear on tires and on the certification label. The agency concludes that the designations on the rim are sufficiently separated to preclude confusion and therefore the recommendation by Grove is not undertaken.

The "rim size designation" required by S5.2(b) is defined in S4 to mean the rim diameter and width. Daido and Volkswagen asked that a width designation followed by a diameter designation be considered as satisfying the requirement for designation of diameter and width. The agency specified the existing order to distinguish rim designations from tire designations. This order of information is being considered as the uniform practice to be adopted by the International Standards Organization. For reasons of uniformity, the requests are denied.

Volkswagen asked that the "DIN" symbol be permitted to signify compilance of the rim with Standard No. 120 in place of the "DOT" symbol required by S5.2(c) for this purpose. The agency does not find that the requirement of § 114 of the Act for certification is satisfied by use of a designation that has a wholly different meaning. Volkswagen's request is therefore denied.

Certification label. The third requirement of Standard No. 120 is that information about suitable tires and rims for use on the vehicles, along with appropriate inflation pressure and speed restriction information, be placed on a label on the vehicle (S5.3). As amended April 29, 1976 (41 FR 18659, May 6, 1976), the standard requires that the information appear on the certification labels of vehicles manufactured on or after September 1, 1977.

Some manufacturers and the Truck Trailer Manufacturers Association (TTMA) objected to the provision of this information on grounds that valid information already appears on the tires and rims that equip the vehicle, and that the information could mislead a person to think that only the listed tires and rims could be used on the vehicle. With regard to the first objection, the NHTSA disagrees and notes that an improper choice of tires or rims (as could occur by replacing original equipment with "custom" rims or the equivalent in tires) could permanently mislead vehicle owners as to the suitable selection of tires and rims. As for the possibility of misleading, the agency believes that a heading over the tire-rim listings (specifically, "SUITABLE TIRE-RIM CHOICE") can be added to the requirements for optional use by a manufacturer who believes the information would be otherwise misleading. With regard to General Motors' note that an owner should be guided by all available information on tire choice (e.g., information in the owner's manual), the agency notes its longstanding position that manufacturers may add statements referring the reader to other publications for additional information.

It is apparent from the examples cited by manufacturers that the decision to place all required data on the certification label could prove cumbersome in some cases, particularly those involving a heavy truck with several available axle combinations. In view of these problems, the agency has decided to remove the restriction on location and permit the information to appear on the certification label or on a separate label that conforms to the requirements for certification labels. The NHTSA notes that this option to provide information on a separate label responds to concern of the Truck Body and Equipment Association (TBEA) for the responsibilities of its final-stage manufacturing membership. The agency does not believe the tire and rim information would be as useful in a location entirely separate from the certification label, and it therefore declines to adopt General Motors' suggestion to use the Vehcile Identification label.

Motorcycle manufacturers and General Motors pointed out that the requirements for listing tire and rim information after GVWR in the case of vehicles such as motorcycles, that only utilize one GVWR listing, is redundant and therefore wasteful of space. Other manufacturers suggested that the tire-rim information was redundant in the case of multiple GVWR listings, although this is not the case because of the need to associate the appropriate GVWR with GAWR's that may exceed the GVWR. In any event, these comments suggest that GVWR and GAWR could be better linked by revision of the example format to reduce the amount of information that must be listed. The solution is to permit listing of the GVWR alone, followed immediately by corresponding GAWR's and appropriate tire-rim information. The clearer format would be used for single and multiple listings. This revision is described in the new example that accompanies the rule changes at the end of this notice. In conformity with this simplification, the rule is also amended to delete the requirements for GVWR tire-rim-inflation listings. Depending on manufacturers' reactions to the simplified format, a similar change could be undertaken for the passenger car example found in Part 567 (§ 567.4(h)(1)).

With regard to the items of information that must be listed in accordance with S5.3, General Motors and the TTMA argued that "tires . . . appropriate *as a minimum* for the GAWR" [emphasis added] could be construed to require tires with load ratings less than those that the manufacturer would choose to recommend. To eliminate any ambiguity, the agency replaces "at a minimum" with "as specified by S5.1.2."

Suzuki asked whether "cold inflation pressure" means the maximum inflation pressure specified by the tire manufacturer. The TTMA also asked for clarification on this point. The answer is that the requirement does not call for maximum pressure, but the pressure specified by the tire manufacturer as sufficient to carry the load specified by the vehicle manufacturer as the tire's share of the assigned GAWR.

Michelin Tire Corporation noted that listing inflation pressure could be misleading in the case of tire designations that call for different inflation pressures depending on the tire construction. It is the agency's view that any possibility of confusion can easily be avoided by an indication that the tire designation represents a radial tire, so that a person substituting a non-radial tire size with the same designation is aware that the two tires are not identical.

The TBEA requested clarification of the term "maximum speed" as it appeared in the example that accompanied the final rule. The TBEA appeared to misunderstand the example as a reference to the speed capabilities of the vehicle instead of the speed restriction of the tires. The agency has in mind only the rare tire types constructed for transit buses and mining and logging operations and so designated. Goodyear and the TTMA appeared to have the same mistaken impression of the requirement.

Speed-restricted vehicles have now been addressed under S5.1.2. In view of the confusion that arose over the requirement, and the agency's assumption that the users of these tires are knowledgeable in the use of the tires, it has been decided to drop the requirement of S5.3(d) altogether.

The TTMA raised several other questions with regard to the information that appears along with the GAWR. In answer to these questions, the effective dates of the standard are such that the manufacturer will be required to list the information specified by S5.3 on and after September 1, 1977. Also, it is not permissible to "bracket" the GVWR and GAWR values for a particular vehicle by specifying the minimum and maximum values that any tire-rim choice could provide. Section 567.4 of Part 567 requires that the GVWR and GAWR's representing the manufacturer determination of the particular vehicle's characteristics must be listed.

The standard does not require the information specified in S5.3 to be listed alongside the additional GVWR's and GAWR's that a manufacturer might list at the end of its certification label as reduced speed ratings. Lastly, the agency does not agree that the GAWR ratings for a semi-trailer are not related to the trailer's GVWR. While the trailer's axles do not support the entire weight of the vehicle, it is still the case that the various GVWR's that could be assigned to a semi-trailer are affected by the

GAWR values that can be assigned, and that the GVWR probably differs depending on the GAWR value assigned. In this sense the GAWR's assigned to a semitrailer's axles do "correspond" to its GVWR.

In accordance with Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this action on the public and private sectors, including possible loss of safety benefits. The new options, simplification, and reduction of marking and labeling requirements should make compliance with the standard less costly, while the changes are not expected to significantly reduce the level of motor vehicle safety. The exception for speed-restricted vehicles provided in S5.1.2 represents a correction of the requirements to reflect the agency's intent not to prevent the assignment of greater load-carrying capabilities to vehicles at lower speeds. Permitting this practice to continue will result in the avoidance of new costs in the economy.

In consideration of the postponement of effective dates already granted for rim marking and the tire information labeling, the agency concludes that the present effective date schedule permits adequate time for compliance.

In view of the three notices that have modified the test of Standard No. 120, the entire standard (incorporating the amendments made by this notice) is published for the convenience of persons affected.

In consideration of the foregoing, Chapter V of Title 49, Code of Federal Regulations, is amended. . . .

Effective date: Changes to the text of the *Federal Register* may be made immediately. The provisions of Standard No. 120 are in effect at this time, except as otherwise provided in the standard.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 28, 1977.

John W. Snow
Administrator

42 F.R. 7140
February 7, 1977

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

(Docket No. 80-16; Notice 2)

ACTION: Final rules.

SUMMARY: This rule makes several minor interpretive and editorial changes to Federal Motor Vehicle Safety Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars*. With respect to the tire and rim selection information required to appear on a placard in new vehicles, the rule requires that the lettering be of specified dimensions and that the information be written in the English language. The rule also incorporates the substance of an existing interpretation of this standard permitting the purchaser of a new vehicle to request the vehicle manufacturer to install the purchaser's retread tires on the vehicle; changes one of the rim labeling examples listed in the standard; and corrects the names of two tire standardization organizations listed in the standard.

EFFECTIVE DATE: December 1, 1984.

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard No. 120, *Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars* (49 CFR § 571.120), specifies tire and rim selection requirements and rim marking requirements for motor vehicles such as trucks, buses, and motorcycles. (Throughout the balance of this preamble, the term "motor vehicles" is used to refer to all types of motor vehicles other than passenger cars.)

Standard 120 was initially published at 41 FR 3478, January 23, 1976. In the course of reviewing this standard, NHTSA noted that some portions of the standards contained minor errors and other portions needed clarification. To correct these shortcomings, NHTSA published a Notice of Proposed Rulemaking (NPRM) at 45 FR 71834, October 30, 1980.

The NPRM proposed changes in the following four areas of the standard:

(1) Requiring the tire and rim selection information which must appear on a placard in the vehicle to be in the English language and of specified dimensions;

(2) Narrowing the provision permitting the purchaser of a new vehicle to have the manufacturer install the purchaser's used tires on the new vehicle, and incorporating the results of an existing interpretation to permit the use of retreaded tires in the same circumstances as used tires;

(3) Changing one of the rim labeling examples listed in the standard; and

(4) Correcting the names of two tire standardization organization listed in the standard.

NHTSA received 13 comments on the NPRM. One comment addressed the first proposed change, stating that there were no objections to the proposed change, if it would permit the use of multilingual labels on vehicles with one of the labels in English and of the specified dimensions. NHTSA generally permits the use of multilingual labels, as long as one part of the label clearly shows the required information in the proper format and in the English language. No change is contemplated in this policy. No other comments were received on this proposed change to the standard, and it is adopted as proposed.

All of the other 12 comments received by the agency opposed the portion of the second proposed change which would limit the use of used and retreaded tires on new vehicles to mileage contract purchasers. (A mileage contract purchaser is a purchaser whose vehicles are equipped with tires purchased or leased from a tire supplier on a cost per mile basis). In the NPRM, the agency stated that this limitation had been implicit in the final rule establishing Standard 120 and that, absent this limitation, "the purchaser could send the vehicle manufacturer palpably unsafe tires (e.g., bald tires or poorly repaired cut tires) and request that these tires be mounted on the new vehicle."

The commenters argued that, regardless of the original intent of the agency when the standard was issued in 1976, the practice since that time has been for almost all vehicle fleets to send tires from their tire banks (tire banks are composed of tires with usable tread left on them which have been taken off vehicles no longer in service) to the vehicle manufacturer for installation on any new vehicles they buy. It was asserted that the proposed language amending Standard 120 would prohibit this practice and increase costs for these vehicle fleets, without any data suggesting that there is a safety problem associated with this practice. Most of the commenters stated that the proposed prohibition was unnecessary since it would not make any sense for a vehicle purchaser to spend $65,000 to $75,000 on a new vehicle, and then install unsafe tires on that vehicle. Further, one commenter noted that the agency's proposal would not prevent a purchaser who wanted to install unsafe tires on a vehicle from doing so. This commenter correctly noted that Standard 120 does not require that new vehicles be equipped with tires. Hence, according to this commenter, a purchaser would simply order a new vehicle delivered without any tires, and then install the unsafet tires on the truck after it was delivered.

NHTSA is persuaded by these comments, and is not adopting the proposed limitation. This rule does amend the standard to permit the installation of retreaded tires on new vehicles, as proposed in the NPRM. All commenters who addressed this change supported it. Further, the practice of using retread tires on new vehicles has been permitted since the agency's issuance in 1978 of an interpretation of Standard 120.

One change has been made to the language proposed in the NPRM to permit retreaded tires to be mounted on new vehicles. The NPRM would have required that retreaded tires to be mounted on new vehicles have a DOT symbol on the tire, to show that the originl casing was manufactured in compliance with Standard 119. That standard sets forth performance and labeling requirements for new vehicle tires. However, such a requirement would directly contradict another NHTSA requirement in 49 CFR Part 574, *Tire Identification and Recordkeeping*. Section 574.5 states, "The DOT symbol shall not appear on tires to which no Federal Motor Vehicle Safety Standard is applicable..." No Federal motor vehicle safety standard is applicable to retreaded vehicle tires. Hence, adopting the proposed requirement would either necessitate amending section 574.5 or force retreaders to violate one of these two requirements dealing with the presence of a DOT symbol on these tires.

The agency has decided not to require that retreaded tire mounted on new vehicles bear the DOT symbol placed on the tires by their original manufactures. Further, the agency is publishing in today's *Federal Register* a proposal to amend section 574.5 to permit retreaders of tires for use on motor vehicles other than passenger cars either to leave the DOT symbol on the tires or to remove the symbol. The agency has tentatively concluded that continuing to require the removal of the symbol does not serve any safety purpose. As the proposal notes, the value of the DOT symbol on a retreaded tire in assessing the probable performance of the tire is believed by the agency to be very significant. Intervening factors such as latent problems with the carcass of the original tire, inadvertent damage to the carcass during the retreading process, the amount of old tread are of far greater significance in determining the performance of the retreaded tire than the condition of the carcass when the tire was new.

No comments were received on the agency's third and fourth proposed changes, which are minor editorial corrections. These are adopted herein as proposed.

NHTSA has analyzed the impacts of this action and determined that they are not "major" within meaning of Executive Order 12291 or "significant" within the meaning of the Department of Transportation regulatory policies and procedures. The principal impacts of this rule are to clarify some portions of the standard, and to explicitly authorize existing industry practices, which have been permitted by an interpretation of the standard. There will be no additional paperwork or costs imposed on vehicle manufacturers, tire manufacturers, or the public as a result of this rule. There will be no cost savings either, since the rule merely authorizes existing practices. Accordingly, a full regulatory evaluation has not been prepared.

The Regulatory Flexibility Act is not applicable to this rule, because that Act applies only to rulemaking proceedings in which the NPRM was issued on or after January 1, 1981. The NPRM in this action was issued in October 1980. If that Act were applicable, NHTSA would certify that this rule will not "have a significant economic impact on a substantial number of small entities" and state that a Regulatory Flexibility Analysis was therefore not required. This rule will simply clarify existing requirements without any economic impacts on small entities.

Issued on May 11.

49 F.R. 20822
May 17, 1984

MOTOR VEHICLE SAFETY STANDARD NO. 120

Tire Selection and Rims for Motor Vehicles Other Than Passenger Cars

S1. Scope. This standard specifies tire and rim selection requirements and rim marking requirements.

S2. Purpose. The purpose of this standard is to provide safe operational performance by ensuring that vehicles to which it applies are equipped with tires of adequate size and load rating and with rims of appropriate size and type designation.

S3. Application. This standard applies to multipurpose passenger vehicles, trucks, buses, trailers, and motorcycles, and to rims for use on those vehicles.

S4. Definitions. All terms defined in the Act and the rules and standards issued under its authority are used as defined therein.

"Rim base" means the portion of a rim remaining after removal of all split or continuous rim flanges, side rings, and locking rings that can be detached from the rim.

"Rim size designation" means rim diameter and width.

"Rim diameter" means nominal diameter of the bead seat.

"Rim width" means nominal distance between rim flanges.

"Rim type designation" means the industry or manufacturer's designation for a rim by style or code.

"Weather side" means the surface area of the rim not covered by the inflated tire.

S5. Requirements.

S5.1 Tire and rim selection.

S5.1.1 Except as specified in S5.1.3, each vehicle equipped with pneumatic tires for highway service shall be equipped with tires that meet the requirements of Standard No. 109 (§ 571.109) or Standard No. 119 (§ 571.119), and with rims that are listed by the manufacturer of the tires as suitable for use with those tires, in accordance with S4.4 of Standard No. 109 or S5.1 of Standard No. 119, as applicable.

S5.1.2 Except in the case of a vehicle which has a speed attainable in 2 miles of 50 mph or less, the sum of the maximum load ratings of the tires fitted to an axle shall be not less than the gross axle weight rating (GAWR) of the axle system as specified on the vehicle's certification label required by 49 CFR Part 567. If the certification label shows more than on GAWR for the axle system, the sum shall be not less than the GAWR corresponding to the size designation of the tires fitted to the axle. If the size designation of the tires fitted to the axle does not appear on the certification label, the sum shall be not less than the lowest GAWR appearing on the label. When a tire listed in Appendix A of Standard No. 109 is installed on a multipurpose passenger vehicle, truck, bus, or trailer, the tire's load rating shall be reduced by dividing by 1.10 before calculating the sum.

S5.1.3 [In place of tires that meet the requirements of Standard No. 119, a truck, bus, or trailer may at the request of a purchaser be equipped at the place of manufacture of the vehicle with retreaded or used tires owned or leased by the purchaser, if the sum of the maximum load ratings meets the requirements of S5.1.2. Used tires employed under this provision must have been originally manufactured to comply with Standard No. 119, as evidenced by the DOT symbol. (49 F.R. 20822—May 17, 1984. Effective: December 1, 1984)]

S5.2 Rim marking. On and after August 1, 1977, each rim or, at the option of the manufacturer in the case of a singlepiece wheel, wheel disc shall be marked with the information listed in paragraphs (a) through (e), in lettering not less than one-eighth inch high, impressed to a depth or, at the option of the manufacturer, embossed to a height of not less than 0.005 inch. The information listed in paragraphs (a) through (c) shall appear on the weather side. In the case of rims of multipiece construction, the information listed in paragraphs (a) through (e) shall appear on the rim base and the information listed in paragraphs (b) and (d) shall also appear on each part of the rim.

(a) A designation which indicates the source of the rim's published nominal dimensions, as follows:

(1) "T" indicates The Tire and Rim Association.

(2) "E" indicates The European Tyre and Rim Technical Organisation.

(3) [“J” indicates Japan Automobile Tire Manufacturers Association.]

(4) "D" indicates Deutsche Industrie Norm.

(5) "M" indicates The Society of Motor Manufacturers & Traders, Ltd.

(6) "B" indicates British Standards Institution.

(7) "S" indicates Scandinavian Tire and Rim Organization.

(8) "N" indicates an independent listing pursuant to S4.4.1(a) of Standard No. 109 or S5.1(a) of Standard No. 119.

(b) The rim size designation, and, in case of multipiece rims, the rim type designation. For example: 20 × 5.50, or 20 × 5.5.

(c) The symbol DOT, constituting a certification by the manufacturer of the rim that the rim complies with all applicable motor vehicle safety standards.

(d) A designation that identifies the manufacturer of the rim by name, trademark, or symbol.

(e) The month, day, and year, or the month and year, of manufacture, expressed in numerals. For example,

"September 4, 1976" may be expressed as:

$$90476, \quad \begin{matrix}904\\76\end{matrix} \quad \text{or} \quad \begin{matrix}76\\904\end{matrix}$$

"September 1976" may be expressed as:

$$976, \quad \begin{matrix}9\\76\end{matrix} \quad \text{or} \quad \begin{matrix}76\\9\end{matrix}$$

S5.3 Label information. (For vehicles manufactured on and after September 1, 1977) The information specified in S5.3.1 through S5.3.3 shall, in the format set forth following this section, appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter, or at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of Part 567 of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.1 [Vehicles manufactured before December 1, 1984. Each vehicle manufactured before December 1, 1984, shall show the information specified in S5.3.3 through S5.3.5 in the format set forth following this section. The information shall appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter; or, at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.2 [Vehicles manufactured on and after December 1, 1984. Each vehicle manufactured on and after December 1, 1984 shall show the information specified in S5.3.3 through S5.3.5 in the English language, lettered in block capitals and numerals not less than three thirty-seconds of an inch high and in the format set forth following this section. This information shall appear either—

(a) After each GAWR listed on the certification label required by § 567.4 or § 567.5 of this chapter; or, at the option of the manufacturer,

(b) On a tire information label affixed to the vehicle in the manner, location, and form described in § 567.4(b) through (f) of this chapter, as appropriate for each GVWR-GAWR combination listed on the certification label.

S5.3.3 [The size designation of tires (not necessarily those on the vehicle) appropriate (as specified in S5.1.2) for the GAWR.

[**S5.3.4** The size designation and, if applicable, the type designation of rims (not necessarily those on the vehicle) appropriate for those tires.

[**S5.3.5** Cold inflation pressure for those tires. (49 F.R. 20822—May 17, 1984. Effective: December 1, 1984)]

S6. Vehicles manufactured from September 1, 1976, to February 28, 1977. Notwithstanding any other provision of this standard, a vehicle to which this standard applies that is manufactured during the period from September 1, 1976, to February 28, 1977, shall meet each requirement of this standard, with the following exception: In place of tires that meet Standard No. 119 (§ 571.119), the vehicle may be equipped with tires that meet every requirement of that standard other than the tire marking requirements of S6.5 of that standard.

41 F.R. 3478
January 23, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses and Trailers

(Docket Nos. 70–16, 70–17; Notice No. 2)

The purpose of this notice is to amend § 571.21 of Title 49, Code of Federal Regulations, by adding Motor Vehicle Safety Standard No. 121, Air Brake Systems—Trucks, Buses and Trailers. Notices of proposed rulemaking on this subject were published on June 25, 1970 (35 F.R. 10368) and June 26, 1970 (35 F.R. 10456). The comments received in response to the notices and information obtained at a technical conference held on October 20, 1970 (35 F.R. 14736, September 22, 1970) have been considered in the development of the final rule. The trailer requirements are joined with the truck and bus requirements in a single air brake systems standard.

The standard as adopted specifies requirements for the safe performance of air brake systems under normal and emergency conditions. It should be noted that the term "air brake system" as defined in the standard applies to the brake configuration commonly referred to as "air over hydraulic," in which failure of either medium can result in complete loss of braking ability.

The standard establishes a set of requirements to govern the braking behavior of a vehicle during application of the service brakes. Principal among these are stopping performance requirements that include a minimum stopping distance requirement for trucks and buses and lateral stability and wheel lockup requirements for all vehicles. To more accurately reflect the friction characteristics of a surface with a skid number of 75, the stopping distances for trucks and buses on a dry surface have been increased over those proposed in the notice. The required distance from 60 m.p.h. is now 245 feet rather than 216 feet and the distance from 20 m.p.h. is 33 feet rather than 29 feet. The stopping distance on a wet surface at 20 m.p.h., 54 feet, has been retained. Several comments indicated that there are no test facilities on which the 60 m.p.h. stop on a wet surface can be safely conducted. As a measure of brake efficiency, moreover, the 20 m.p.h. stop on a wet surface satisfactorily indicates the vehicle's behavior at higher speeds, and the standard therefore specifies only the 20 m.p.h. stopping distance test.

The requirement that the vehicle stay within a 12-foot-wide lane has been adopted as proposed. The proposed requirement that no wheel lock except momentarily has been modified to permit lockup to occur on the leading nonsteerable axle on vehicles having more than two nonsteerable axles. A review of available information indicates that satisfactory control of the vehicle can be maintained if lockup is avoided on two nonsteerable axles. The rule also permits lockup at speeds under 10 m.p.h. Such low speed lockup is not considered hazardous and allows greater flexibility in brake system designs.

Some comments stated that the requirement for a controlled stop without lockup favored one variety of stability-controlling device—the antilock device—over other systems such as load proportioning devices. Several comments seemed to assume that the proposal required antilock devices. The requirement that the vehicle stop without locking its wheels reflects the Administration's judgment that a vehicle with locked wheels, whatever its equipment, is unstable and uncontrollable in an emergency situation. The Administration recognizes the likelihood that manufacturers of some types of vehicles may have to incorporate proportioning or antilock devices into their systems in order to meet the stopping distance requirement. However, the manner in which lockup is prevented is not specified in the standard, and if a proportioning device or any other device can produce the desired result, it may be incorporated into the vehicle's braking system.

Although an antilock device is not required, if it is used on a vehicle it must conform to several requirements. A warning signal must be provided to warn of total system failure, a failed device must not interfere with the operation of the service brake, and electrical elements in the system must be powered through the vehicle's stop lamp circuit. Of these requirements, the first was the subject of comments that indicated some uncertainty as to the nature of a total system failure. The reason for the requirement is that a driver ought to be warned in the event that a system on which he has come to rely has stopped working altogether. Monitoring of each device separately would be difficult and costly, while monitoring of the shared elements of the system, such as the electrical circuitry, would be relatively simple. Although electrical problems would be the most likely cause of total failure, other components may also produce such failure and the language of the requirement has not been limited to a specific type of failure. A requirement that electrical power for antiskid devices on trailers must be provided through the stop lamp circuit has been added to insure the functioning of antilock systems in vehicle combinations in which the towed vehicle has an antilock system.

The requirements for actuation and release times, for brake retardation force, and for brake power have been modified somewhat in the light of information provided by the comments. The notice proposed timing curves for brake actuation and release, but subsequent review has indicated that adhesion to a timing curve is less significant than the basic ability to apply and release the brakes quickly. The curves have therefore been omitted in favor of a single application time of 0.25 second and a single release time of 0.50 second. These values are somewhat less stringent than those proposed in the notice, and reflect the judgment that a system that can meet the stopping distance requirements without lockup has less need for the rapid times originally proposed. Vehicles intended to tow other vehicles equipped with air brakes must still meet the actuation and release times with a 50-cubic-inch test reservoir attached to the service line outlet, but the requirements for pressurization of the test reservoir itself have been deleted.

The brake retardation force requirement was the subject of numerous comments, some to the effect that the retardation force was too high to permit safe operation of vehicle combinations in which new and old vehicles are mixed, and others to the effect that the forces were too high to be achieved with reliability by available friction materials. The Administration has determined that compatibility problems are substantially lessened if the vehicle has the ability to stop without lockup and that the retention of a relatively high retardation force requirement will not lead to significant compatibility problems. It has been determined, however, that the stopping distance requirements can be met by brakes having a somewhat lower retardation force capacity than proposed, and a lower force requirement is therefore adopted.

Comments regarding the proposed brake power requirements stated that the fade characteristics required of the linings might exceed the limits of existing technology and might not be compatible with the retardation force requirements. In the light of these comments and other information it has been determined that the brake power requirements should be reduced. Accordingly the standard as adopted requires 10 decelerations at a rate of 9 feet per second per second at intervals of 72 seconds with the air pressure at 90 p.s.i. or less, and a final deceleration at 14 f.p.s.p.s. from 20 m.p.h. with a service line air pressure of 108 p.s.i. or less. In the light of the diminished power requirements, the recovery requirements have been retained with a minor adjustment from 45 p.s.i. to 40 p.s.i. in the minimum air pressure required.

A series of alterations have been made in the equipment requirements in response to comments and as a result of reevaluation by the Administration. First among these is the alteration of the stop lamp switch requirement to permit use of a pneumatic switch. The requirements for compressor capacity have been modified to require it to increase air pressure in the reservoirs from 85 p.s.i. to 100 p.s.i. in not more than 25 seconds, in place of the proposed requirement of 0–85 p.s.i. in 2 minutes. The mandatory requirement for a supply reservoir has been removed, and the overall reservoir capacity for trucks and buses has been reduced to 12 times the combined brake chamber capacity. The drain valve requirement has been simplified, the tolerance on the air pressure gauge has been broadened to ±7 percent of the compressor cut-out pressure, and the low air pressure warning requirement has been modified to permit visible, nonaudible signals within the driver's forward field of view.

The notice proposed that each truck and bus have a split service brake system. It has been determined that the additional cost and greater complexity of a split system on vehicles equipped with air brakes are not accompanied by safety benefits great enough to justify requiring a split system. Accordingly, the requirement has been deleted. The remaining system with emergency capabilities is the parking brake system, and it has been determined that a parking brake system complying with the applicable requirements of the standard will provide a safe means of stopping the vehicle in the event of service brake failure.

Two aspects of the parking brake system were the subject of considerable comment. A number of comments stated that no maximum static retardation force should be specified, and several comments stated that the parking brakes should not apply automatically. The standard as adopted retains both the maximum retardation and the automatic application requirements. Each has a role in the safe operation of the parking brake system. If no maximum retardation force were specified, there would be considerable risk of lockup during emergency braking. The requirement as adopted, however, raises the upper limit on the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

from 0.33 to 0.40.

Comments stated that automatic application of the brakes while the vehicle is in motion could induce hazardous instability, due to wheel lockup or to the unexpected nature of the braking. It has been determined that adequate safeguards exist in the standard to avoid such problems. The required low pressure warning signal must operate at a pressure well above the automatic application pressure so that the driver will have sufficient warning of incipient brake application. In addition, the limit on retardation force will act to prevent lockup under all but the most severe conditions. With respect to trailers, the automatic functioning of the parking brake system is further insured by the deletion of the proposed requirement for a check valve or similar device to protect the trailer's air pressure.

The parking brake controls have been considerably simplified by uniting in one control the manual on-off operation and the release-after-automatic-application function.

Many comments revealed a misunderstanding about the Administration's purpose in specifying test conditions. It should be understood that the standards are not instructions for, or descriptions of, manufacturer tests. For example, the condition that states that "(t)he wind velocity is zero," simply means that the vehicle must meet the applicable tests if (among other things) the air is still, that is, if the wind neither helps nor hinders the vehicle's performance. One way in which the manufacturer could check his vehicle's conformity with reference to the zero wind condition is to run the braking test with a resultant tailwind. With reference to another condition, such as the surface with a skid number of 75, the test could be run on a surface having a skid number lower than 75. Manufacturers are required to exercise due care to insure that their vehicles will meet the standard if tested by the Administration under the specified conditions, but they are at their own discretion in devising an appropriate testing program for that purpose.

A few changes have been made in the test conditions. The notice had proposed, in addition to the zero wind condition, that the vehicle stay in the roadway with a wind of 30 m.p.h. from any direction. On review, the 30-m.p.h. speed has been determined to be excessive and to unduly increase the problems of testing. In addition, most stability problems are controlled by preventing wheel lockup, as required by the standard, and the crosswind condition has therefore been deleted. In place of the "lightly loaded vehicle weight," a weight condition based on the vehicle's unloaded weight is used.

Effective date. Because of the development work and preparation for production that this standard will require, it is found that an effective date later than 1 year from the date of issuance is in the public interest. Accordingly, the standard is effective January 1, 1973.

In consideration of the above, § 571.21 of Title 49 of the Code of Federal Regulations is amended by adding Motor Vehicle Safety Standard No. 121 as set forth below. This standard is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 19, 1971.

Douglas W. Toms,
Acting Administrator, National Highway Traffic Safety Administration

36 F.R. 3817
February 27, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses, and Trailers

(Dockets No. 70–16 and 70–17; Notice 3)

The purpose of this notice is to respond to petitions requesting reconsideration of Motor Vehicle Safety Standard No. 121, *Air Brake Systems*, § 571.121 of Title 49, Code of Federal Regulations. After issuance of the standard on February 19, 1971 (36 F.R. 3817, February 27, 1971), petitions for reconsideration were filed pursuant to 49 CFR 535.35 by a number of vehicle and equipment manufacturers. This notice grants some of the requests by amending the standard, and denies other requests.

1. *Service brake system.* The service brake system requirements have been reorganized for reasons of clarity and have been amended with respect to the order of testing and the number of tests to be conducted. The dynamometer tests have been separated from the road tests and placed in section S5.4. The road test section has been amended to specify the order in which the stopping tests are to be run. The section is further amended to provide that a truck or bus will be stopped six times for each combination of loading, speed and road conditions and that it will be considered to meet the requirement if one stop is made in the required distance with the required stability and freedom from wheel lockup. This amendment has been adopted to ease the problems arising from a test driver's unfamiliarity with a vehicle's behavior. To accomodate antilock systems that permit some wheels to lock for longer periods than others, the reference to "momentary" lockup in S5.3.1 and S5.3.2 has been amended to refer to "controlled" lockup.

S5.3.2, *Stopping Capability*, *Trailers*, has been amended in minor respects, to make it clear that the 90 p.s.i. pressure level is system-wide and not confined to the brake control lines, and to provide that the trailer is to stop the combination of vehicles without benefit of the towing vehicle's brakes.

The brake power requirements of S5.4.2 and the dynamometer test conditions of S6.2 are each amended to refer to the drum "or disc" to avoid the possibility that the sections would be misconstrued as requiring drum brakes. The brake recovery requirements of S5.4.3 are amended by lowering the minimum air pressure requirement to 20 p.s.i. from 40 p.s.i. This amendment is based on a reassessment of the problems associated with over-recovery that has led the NHTSA to conclude that 20 p.s.i. is a reasonable level.

The requirements concerning antilock system failure and the provision of power for antilock systems on trailers have been separated from the other service brake requirements and placed in S5.5.

2. *Service brake retardation force.* The standard as adopted in February 1971 required the brakes on each axle to produce specified retardation forces at each of several brake chamber air pressures. As indicated in the issuance of the standard, the primary goal of the retardation force requirement was to insure brake compatibility between vehicles used in combination. On review of petitions requesting exemption of vehicles that do not tow other vehicles from the retardation force requirements, the NHTSA has determined that for these vehicles the requirements are not necessary. Accordingly, S5.4.1 is amended to apply only to vehicles that are intended to tow or to be towed by another vehicle equipped with air brakes.

In response to petitions objecting to axle by axle force calculations, the retardation force requirements are further amended to provide that the retardation force for all axles shall be added together and divided by the sum of gross axle ratings to arrive at the values shown in Table III. The effect of the amendment is to allow greater flexibility in the allocation of braking force between axles.

The overall braking force required of the vehicle's brakes, however, remains the same as before. The NHTSA has considered and rejected the requests for different retardation values and for substitution of SAE J992a for the dynamometer tests of S5.4.1. The present retardation force requirements in Table III are considered to be a reasonable accommodation between the need for compatibility with existing vehicles and the need to establish a uniform pattern of brake response over the range of operating pressures. The dynamometer procedures of S5.4.1.1, which permit measurement of brake forces on an individual vehicle, are more suited to the regulatory purpose of this standard than are the procedures of SAE J992a, which provides for road testing of vehicles in combination. The agency recognizes that the availability of dynamometers of sufficient capacity is a concern to many petitioners, but available evidence indicates that dynamometer access will not be a major long-term problem. The petitions to delete dynamometer testing are therefore denied.

3. *Parking brake system.* The parking brake system required by S5.4 of the standard had several features that were widely objected to by the petitioners. In particular, petitioners objected to the requirement for automatic application of the parking brakes in the event of pressure loss. Although the standard specified a maximum retardation force level of 0.40 to reduce the possibility of lockup during automatic application, many petitioners stated that automatic application of the brakes would surprise the driver and adversely affect his handling of the vehicle.

The NHTSA remains convinced that automatic application of the parking brake is a satisfactory means of providing braking in the event of service brake failure. The low pressure warning signal required by S5.1.5 is considered adequate to warn a driver of impending application of the parking brake to avoid most of the effects of surprise. However, review of the petitions has persuaded the agency that automatic application of the parking brake need not be mandatory. Accordingly, the standard is amended to provide for an alternative parking brake system that is manually, and not automatically, applied.

To accommodate the new alternative, the parking brake requirements have been reorganized into two main sections: S5.6, which specifies requirements for parking brakes generally, and S5.7, which sets out the emergency braking capabilities for automatic systems (S5.7.1) and manual systems (S5.7.2) on trucks and buses. A third section (S5.8) deals with the emergency braking of trailers.

The general requirements of S5.6 are derived from S5.4 of the original standard, with some additions and amendments. The braking force generated by the parking brakes is measured, at the manufacturer's option, either by a static draw bar test, which must produce a force level of 0.28, or by a holding test on a 20% grade. The tests are to be conducted in both forward and rearward directions. As provided in the original standard, the parking brakes must be applied by an energy source that is independent of the air pressure in the service brake system.

Additional changes have been made in S5.6 with respect to the requirements for the parking brake control. The standard as published in February 1971 specified the shape and color of the parking brake control, as well as its location, and provided that manual operation and release after automatic application should be accomplished by movement of a single control. After review of the petitions, it has been decided to allow greater flexibility in the design and operation of the control. Efforts are now underway within the industry to standardize controls, and it may be that a consensus will be reached upon which a more standardized control can be based. In the meantime, the standard's specifications have been reduced to requiring the control to be separate from the service brake control, operable from the normal driving position, and identifiable as to its method of operation. The shape, color, and number of controls, and the method of operation, are left to the judgment of the manufacturer.

The major difference between the emergency braking performance required of a vehicle with a manual system and the performance required of a vehicle with an automatic system is that a vehicle with a manual parking brake is required by S5.7.2.3 to meet a stopping distance test with an air pressure failure in the service brake system. Although a manufacturer may elect to use the parking brakes to provide this emergency stopping capacity, he may use other components to supplement the parking brakes or he may use a system entirely independent of the parking brakes.

A vehicle with an automatic parking brake may, at the manufacturer's option, either meet the stopping distance test of S5.7.2.3, or have a maximum static retardation force not greater than 0.40, measured in accordance with S5.6.1. Several petitioners requested deletion of the maximum retardation force levels for automatic brakes. Although the agency remains concerned about the effects on a vehicle's stability of automatic brake application, it has determined that a vehicle capabable of meeting specified stopping distance requirements when the brakes are automatically applied should not be held to the maximum force level requirement.

With respect to both automatic and manual brakes, provision is made for control of the parking brakes of the towed vehicle. It was noted by some petitioners that automatic application of a towing vehicle's brakes, without simultaneous application of a towed vehicle's brakes, could lead to unstable braking and possibly to jackknifing. To lessen the risk of such instability, the automatic brake requirements are amended to require the venting of the towed vehicle's supply line so that its brakes will apply upon application of the towing vehicle's brakes.

4. *Other provisions amended.* In S4 the definition of "antilock system" has been amended to refer to "rotational wheel slip" to distinguish the phenomenon controlled by the antilock systems from other types of wheel slip. The definitions of "gross axle weight rating," "gross vehicle weight rating," and "unloaded vehicle weight" have been omitted, since they have been incorporated in the general definitions section of Part 571, 49 CFR 571.3(b).

The equipment requirements have been amended in a number of minor respects. S5.1.1 has been amended to include supply reservoir capacities. The reservoir capacity required has not been changed, but the requirement is clarified by striking the words "greater than" in S5.1.2.1 and in S5.2.1.1. The requirement for a towing vehicle protection valve (S5.1.3) has been amended by the use of the broader term "system" in place of "valve."

The pressure gauge requirement (S5.1.4) has been amended to require a gauge in each service brake system, rather than to require a gauge directly on the service reservoir. The warning signal requirement (S5.1.6) is amended in response to petitions to provide that warning must be by means other than the pressure gauge indicator. The antilock warning signal requirement (S5.1.6), has been amended to limit the warning to the event of electrical failure, pending investigation of other types of failure for which a warning may be practicable.

5. *Petitions denied.* Several requests for amendment of the equipment requirements have been denied. A request that the service reservoirs be connected in series has been rejected as unnecessary and design restrictive. Requests for reduction in minimum reservoir capacity are also denied. The present requirement of 12 times the combined volume of service brake chambers has been applied by the SAE to intracity buses and school buses for some time and is considered a reasonable requirement for other vehicles, particularly in the light of additional demands made on air capacity by antilock systems.

Several petitions requested amendment of the vehicle weights specified in S5.3 for the service brake tests. Requests were made for additional weight on the vehicle in its unloaded condition to allow for the weight of the completed body and for safety equipment such as roll bars used during testing. Since the vehicles tested by the NHTSA will be completed vehicles, however, it is not appropriate to specify an additional weight. If an incomplete vehicle manufacturer wishes to ascertain the performance of this vehicle in one or more of its completed variations, he may do so by placing weights on the incomplete vehicle, by actually mounting a body on it, or by any other means that are reasonably calculated to evaluate the braking performance of the completed vehicle. With respect to safety equipment, the NHTSA regards the problem of weight associated with safety devices as easily surmountable. Each of the petitons requesting changes in the weights specified in S5.3 is accordingly denied.

A number of petitions requested increases in the stopping distance required by S5.3.1. The distances specified are considered reasonable and well within the state of the art. Greater distances would increase the disparity between trucks and cars and be contrary to the interests of safety. The petitions are denied. Similarly, the petitions for an increase in the skid number of the dry surface from 75 to 80 are denied. The 75 number is representative of road surfaces, and has been a part of the consumer information requirements long enough that the availability of skid pads should not be a probelm. Similarly, the requests that 30 skid number tests be run on dry pavement or that they be abandoned are denied. Braking in wet weather is an evident problem with vehicles of all types, and the NHTSA regards the wet-track test as an essential part of the standard.

The stopping capability requirement for trailers (S5.3.2) was the subject of petitons requesting deletion of the 90-p.s.i. pressure level requirement and objecting to the uncertainty involved in determining whether the tractor or the trailer is responsible if the trailer leaves the 12-foot-wide lane. The NHTSA regards a uniform service line pressure specification as an appropriate means of insuring uniformity in trailer response, even though some tractors may be designed to modulate air pressure in the lines. Since only the trailer is to be braked, the cause of deviation from the lane will be the trailer's brakes, not the tractor's. The petitions are denied.

The actuation and release requirements of S5.3.3 and S5.3.4 were subject to a variety of objections. One petitioner requested deletion of both requirements, while others requested elimination of the 50-cubic-inch test reservoir for trailers that tow other trailers. On review, the NHTSA has decided to deny the petitions. Although the stopping distance test of S5.3.1 necessarily limits the actuation time that a manufacturer can allow, the additional constraint placed on timing by S5.3.3 has the important effect of producing full braking at a very early point during the braking maneuver where the speed is greatest and the effects of a reduction in speed most significant from the standpoint of the forces involved in a crash. The brake release time has an important bearing on the maneuverability and directional stability of vehicles in emergency situations. It can sometimes be as important for the brakes to come off quickly and evenly as for them to be applied quickly.

The 50-cubic-inch test reservoir has been employed for some time in the SAE brake testing. It has therefore been retained. Other suggestions in the petitions for service reservoir timing and for additional test component specifications are not adopted at this time but may be appropriate subjects for future amendment.

With respect to the loading conditions specified in S6.1.1, a number of petitioners stated that the front-rear brake balance needed to achieve conforming performance on a truck-tractor loaded to GVWR in its bob-tail configuration would not be the best balance for that tractor when towing a trailer. This appears to be a valid objection, but the most obvious alternative—testing with a trailer in tow—involves complexities that have not been fully discussed in the petitions. A notice is therefore being prepared to propose that a truck tractor be tested with a trailer during the stopping distance tests.

Effective date: September 1, 1974. Review of the numerous petitions for extension of the effective date from January 1, 1973, has led to the conclusion that an effective date of September 1, 1974, would permit a longer period of fleet testing to evaluate the durability of the new systems and that the resulting production systems are likely to be substantially improved by the additional time allowed. An effective date later than one year from the date of issuance is therefore found, for good cause shown, to be in the public interest.

In consideration of the above, Motor Vehicle Safety Standard No. 121, Air Brake Systems, in § 571.21 of Title 49, Code of Federal Regulations, is amended to read as set forth below. This amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 16, 1972.

Douglas W. Toms
Administrator

37 F.R. 3905
February 24, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses and Trailers

(Docket No. 70–17; Notice No. 4)

The purpose of this notice is to respond to petitions filed pursuant to 49 CFR § 553.35, seeking reconsideration of the amendments to Motor Vehicle Safety Standard No. 121, Air Brake Systems, published February 24, 1972 (37 F.R. 3905). The petitions are granted in part and denied in part.

I. *Amendments*

S5.1.6 International Harvester stated that the operation of the antilock warning system should be the same as that of the low pressure warning signal under S5.1.5. S5.1.6 presently requires an audible warning of at least 10 seconds duration regardless of whether the visible signal required by the section is within the driver's forward field of view. The change requested by International Harvester would require an audible warning only if the visual warning is out of the driver's forward field of view. On reconsideration, the NHTSA has concluded that the system requested by International Harvester will give the driver adequate warning of antilock system failure. S5.1.6 is therefore being amended to parallel S5.1.5.

S5.1.5 and S5.1.6 In a letter designated as a request for clarification or interpretation, General Motors suggested that because diesel systems do not have an "on" position, they might be considered exempt from the requirement that the antilock warning signal must operate when the ignition is in the "on" position. Although the NHTSA does not consider it likely that the requirement will be understood as exempting diesels, the agency has concluded that amending the standard to refer to the "run" position as suggested by GM would avoid any possibility of misinterpretation. S5.1.5 and S5.1.6 are amended accordingly.

S5.2.1.1 Midland-Ross requested that a pressure should be specified at which the protected reservoir should be capable of releasing the parking brakes. On reconsideration, it seems appropriate to specify a pressure that corresponds to the lower end of the range of pressures maintained by current compressors. The section is therefore amended to specify a pressure of 90 p.s.i. The related question of when the brake is considered to be released, also raised by Midland-Ross, does not require amendment. The NHTSA considers a brake to be released at the point where it no longer exerts any torque.

S5.2.1.2 In response to a question in the Midland-Ross petition and a related request for interpretation by Wagner Electric Corporation, this section is amended by adding the word "service" before "reservoir", so that the section, as amended, requires the total service reservoir volume to be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms. The amendment reflects the basic intent of S5.2.1.2, which is to have a specified volume of air available to the service brakes.

S5.4 Several petitioners stated that S5.4 appeared to exempt some vehicles from the dynamometer requirements. This impression is erroneous, in that all vehicles are required to conform to S5.4. The source of the confusion appears to be the sentence in S5.4 which states that "[a] brake assembly that has undergone a road test pursuant to S5.3 need not conform to the requirements of this section". The intent of the standard is to conduct the dynamometer tests on new brake assemblies, and the quoted sentence was intended to make it clear that a single brake assembly would not have to pass the road test and the dynamometer test in succession. The sentence is being amended to clarify its meaning.

S5.7.1.4 This section is amended in response to a request by Wagner Electric, to require manual application whenever the system pressure prevents automatic application.

II. *Provisions not amended*

With respect to the remaining petitions, no changes are being made in the standard. In some cases this is because the petitioner has misinterpreted the applicable provisions to his disadvantage and needs no amendment to obtain the relief he wants. In other cases, the agency has concluded that the requested amendments do not serve the need for motor vehicle safety. In one or two cases, the change requested may prove desirable but cannot be fully evaluated without further information. The following discussion deals with the petitioned requirements in numerical order.

S3. Clark Equipment Company requested the addition of trailer converter dollies to the list of affected vehicles. The addition is not necessary, in that a converter dolly is a "trailer" within the meaning of that term in 49 CFR 571.3(b).

S5.1 Clark Equipment Company requested an amendment to exclude vacuum brake systems from the equipment requirements of S5.1. Despite the reference to a vacuum assist in S4, the standard does not apply to vacuum brakes and therefore does not require vacuum systems to have the equipment described in S5.1.

S5.1.2.2 It was suggested by Midland-Ross that the requirement that the reservoir must be capable of "withstanding" the specified pressure was not sufficiently precise. It may be that experience will show a need for quantification of this requirement, but the agency does not consider it to be necessary at this time. A reservoir will be considered to withstand the test pressure if it shows no pressure loss during the test interval.

S5.1.3 It was suggested by Midland-Ross that the requirements for the towing vehicle protection system should be amended to indicate the degree of protection required and the operating modes protected. The agency's response is much the same as its response on S5.1.2.2: the suggestion may prove to have merit, if systems appear which cause problems in service. At this point, however, the agency will retain the broad requirement that a towing vehicle must have a system to protect it from the loss of air pressure in the towed vehicle, without regard to the system's design or method of operation.

S5.1.5 Midland-Ross requested an increased pressure level at which the low pressure warning signal actuates, so that it would be above the protection valve trip pressure used in new trailers. The requested change is not necessary, in that the standard does not now prevent the manufacturer from setting the signal actuation level at a pressure above 60 p.s.i. If Midland-Ross wishes to set its level at 80 p.s.i., it may do so.

S5.1.6 Clark Equipment Company requested that the antilock warning signal requirements be expanded to apply to the failure of a towed vehicle's antilock system. The NHTSA is receptive to further discussion of this issue. However, it has decided not to adopt the request at this time. Trailers are not required to have provision for antilock warning systems, and requiring towing vehicles to accommodate systems that are not likely to exist would be unjustified.

S5.3.1 Two petitioners requested amendments of the stopping distance requirements. The Carlisle Corporation requested a longer stopping distance, and Midland-Ross requested that the reference to "controlled lockup" be amended to specify a system that would provide for resumption of wheel rotation at some point before the speed falls to 10 m.p.h. Both requests are denied. The distances specified are considered to be appropriate and within the current state of the art. The requested change with respect to wheel lockup would permit systems in which all wheels could be completely locked for substantial periods, a situation that S5.3.1 was designed to avoid.

S5.3.3 Midland-Ross requested that Figure 1, referenced by this section, should be amended by specifying a pressure of 100 p.s.i. in both reservoirs, by omitting the tractor protection valve from the test rig, and by employing a service brake control valve rather than a brake pedal. Because S5.3.3 specifies a pressure of 100 p.s.i., it should be clear that each reservoir would be at that pressure, and no amendment is necessary.

A protection valve is used because such valves are in widespread use, even though they are not required by the standard. The service brake pedal specified in Figure 1 is a service brake foot control valve. No change of label appears necessary.

S5.4.1 International Harvester requested the deletion of this section as unnecessary. As stated before, the purpose of the section is to promote compatibility between the brakes of vehicles used in combination. The agency is of the opinion that it serves the stated function and has therefore retained it.

S5.4.2 Wagner Electric and the Carlisle Corporation each objected to certain aspects of this section. Wagner Electric requested the reinstatement of the phrase "at least" before the deceleration of 9 f.p.s.p.s., and requested the use of the phrase "a minimum" in S5.4.2.1, on the grounds that it is impossible to achieve a deceleration rate of exactly 9 f.p.s.p.s. In response, it should be pointed out that it is not necessary for a manufacturer to conduct his tests at exactly the specified rate, but only to test in such a manner as to assure himself that if the brakes were to be tested at that rate they would meet the requirements. It is to his advantage to test under less favorable conditions than those specified in the standard. The insertion of the language requested by Wagner would, if anything, make the test more severe for the manufacturers, in that the government could run tests with average decelerations in excess of 9 f.p.s.p.s. making the "worst case" situation much more difficult to ascertain.

The Carlisle Corporation objected to procedural disparities between the retardation force tests of S5.4.1 and the brake power tests of S5.4.2. The basic procedural difference between the sections is that the measurement period under S5.4.1 begins when the specified air pressure is reached whereas the period under S5.4.2 begins with the onset of deceleration. Although it may be that different instrumentation will be required in the two tests, they are not for that reason inconsistent or incompatible. The NHTSA considers each procedure to be appropriate for the aspect of performance that it measures.

S5.4.3 The Carlisle Corporation requested a further reduction in the lower limit of the recovery force, from the current level of 20 p.s.i. to 10 p.s.i. The NHTSA considers a brake system that produces a deceleration of 12 f.p.s.p.s. with a pressure of only 10 p.s.i. to be too sensitive and therefore denies the petition.

S5.5.2 Clark Equipment Company objected to the use of the stop lamp circuit to power the antilock system. The basis for the requirement is the need for compatibility between trucks and trailers made by different manufacturers. The stop lamp circuit is the most suitable electrical connection between trucks and trailers because it is always energized when the brakes are applied. It was therefore chosen as the source of power. The agency is of the opinion that the stop lamp circuit has adequate power for single trailer applications. For multiple trailers, it may be necessary to employ complementary systems as permitted by S5.5.2. The petition is therefore denied.

S5.6.1 In response to a request for interpretation by International Harvester, the intent of this section is to require parking brakes on each axle other than steerable front axles.

S5.6.2 Midland-Ross suggested the amendment of this section to specify that a sliding bogie on a semitrailer shall be placed in its most favorable position. As presently worded, the section is silent with respect to bogies so that the NHTSA will be obliged to test in a manner that favors the manufacturer. However, if there are indications that the position of the bogie makes a substantial difference in the braking performance of the vehicle, the agency will consider rulemaking to specify that the trailer must meet the requirements with the bogie in any position.

S5.7.1.1 Wagner Electric requested an amendment to provide for brake application when the pressure in "any" service reservoir is less than the automatic application pressure level. The section now requires application when "all" service reservoirs are below that level. The NHTSA does not consider the requested amendment necessary to permit the type of system that Wagner envisions. It is permissible under the present wording for a manufacturer to have a system that applies the brakes upon a low pressure signal from a single reservoir. To require operation in such a case, as Wagner requests, would eliminate systems that are capable of fully applying the service brakes despite low pressure in one reservoir.

S5.7.2.2 The Clark Equipment Company requested deletion of "brake fluid housing" from the list of items whose failure must not affect the parking brake system. The purpose of the section is to make it clear that the sharing of components by the service and emergency braking systems should not be construed as permitting malfunction of the parking brake system despite the provisions of S5.6.3. The petition is denied.

S5.8 The Clark Equipment Company requested the deletion of the phrase "or S5.6.2" from this section, on the grounds that it converts the requirement into a parking brake requirement that may be weaker than the emergency braking performance currently required under the regulations of the Bureau of Motor Carrier Safety. However, despite the use of .20 rather than the value of .28 specified in S5.6.1, the trailer under S5.6.2 is loaded to its GVWR and the supporting dolly is unbraked so that the braking performance required by the two sections is nearly identical. The NHTSA has therefore decided to retain the option of S5.6.2 under S5.8.

S6.1.1 Midland-Ross requested that the loading of a trailer be based on the sum of its GAWR's rather than on its GVWR. A GVWR designation for trailers is required by Part 567, and the agency considers it appropriate to specify GVWR as the test condition under this section.

S6.1.7 International Harvester again questioned the appropriateness of using a skid number of 75 for road tests. This issue has been raised a number of times in the course of the various braking standard rulemakings. Although the NHTSA is not prepared at this time to state that a number higher than 75 ought to be selected, the agency intends to collect additional data concerning road surfaces with a view to possible future changes.

S6.1.9 Midland-Ross stated that parking brake tests for semitrailers should be conducted with the trailer front end supported by the trailer landing gear. The use of the parking brakes as part of the emergency braking system and the unknown effect of the friction in the landing gear system weigh against the adoption of this requirement. The petition is denied.

S6.2.1 The Carlisle Corporation requested that a 5% tolerance be specified in the dynamometer loading. The request is denied, for the reasons given in the preceding discussion of Wagner Electric's petition on S5.4.2.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 121, 49 CFR § 571.121 is amended . . . .

Effective date: September 1, 1974.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on June 21, 1972.

Douglas W. Toms
Administrator

37 F.R. 12495
June 24, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 73–13; Notice 3)

This notice amends Motor Vehicle Safety Standard No. 121, *Air brake systems*, by modifying the emergency stopping distance requirements for truck-tractors, the parking brake requirements for trailer converter dollies, and the recovery requirements for antilock equipped brakes, and by establishing a new test condition for loaded truck-tractors, special test conditions for certain drive and axle configurations, and a new burnish condition for road tests.

The amendments adopted by this notice represent a partial adoption of the changes proposed in Docket No. 73–13, Notice 1 (38 F.R. 14963; June 7, 1973). The comments to the proposal were divided as to the merits of most of the changes proposed. Running throughout the comments, however, was an overriding concern with lead time. Although a manufacturer might favor a change, such as the proposed change in the burnish condition, he may find himself unable to adjust to it within the time remaining before the standard becomes effective on September 1, 1974. The NHTSA, for its part, does not consider the proposed changes significant enough to warrant postponing the effective date of the standard. The agency has therefore adopted two provisions for which lead time appears to be a problem—the new burnish condition and the new truck-tractor test condition—as options for the period between September 1, 1974, and September 1, 1976. Of the remaining changes proposed in Docket 73–13, some are adopted effective September 1, 1974, others are not being adopted and will not be further considered for adoption, and others remain as candidates for adoption. If the latter are adopted, they will become effective at some date beyond September 1, 1974. The treatment accorded each of the proposed changes is set out in order below.

S4. Definitions were proposed for "isolated reservoir" and "service reservoir". Insofar as the principal use of these definitions was to be in proposed amendments which are not being adopted at this time, there is little purpose in adding them to S4 at this time. They are therefore not adopted.

S5.1.2.5 This new section was to have been added to prevent the diversion of air from the service reservoirs into other reservoirs when the service reservoir pressure is below 60 psi. In addition to questions of lead time, several comments stated that the equipment served by auxiliary reservoirs, such as windshield wipers, often plays a role in safety as significant as that of the brake system. In consideration of these factors, the section is not being adopted at this time, and if subsequently adopted will take into account both lead time and the effects on other safety systems.

S5.1.3 The amendment proposed to the towing vehicle protection system requirements was to have accompanied the amended emergency braking requirements of S5.7, and would have designated the protection system as the system enabling the vehicle to meet the emergency stopping requirements of S5.7.2.2 and S5.7.2.3. The agency has decided to defer action on the amendments to S5.7, as discussed below, and accordingly takes no final action on S5.1.3 at this time.

S5.1.6 An amendment was proposed to the antilock failure signal requirements in response to a petition by Berg Manufacturing Company. Berg has subsequently withdrawn its petition, and in the absence of compelling reasons to adopt the proposed change, the NHTSA has decided not to amend S5.1.6.

S5.2.1.1 The requirement for the reservoir used to release the parking brakes was to be amended to specify two brake releases, rather than one, and to specify the initial pressure from which these releases were to be accomplished. The agency continues to regard these changes favorably, but has decided to defer final action until the issuance of amendments concerning the parking and emergency systems, as discussed under sections S5.6 and S5.7.

S5.3.1 and **S5.3.2**. Rather than amend the general language of these sections concerning the circumstances under which lockup is permitted during a stop, the agency has decided to leave the sections essentially unaltered. In response to requests to clarify the treatment accorded liftable axles, the section is amended to permit, in effect, liftable axles without antilock on vehicles with more than two nonsteerable axles. Liftable axles on vehicles with two nonsteerable axles would continue to be subject to the no-lockup requirement except for controlled lockup allowed by an antilock system.

The principal change proposed for S5.3.1 and S5.3.2 had been a change in the description of permissible lockup from "controlled lockup allowed by an antilock system" to "lockup of wheels controlled by an antilock system that does not permit more than half the wheels on any controlled axle to lock more than momentarily." The intent of the proposed revision was to forestall systems whose "control" over the lockup of wheels, although nominally within the meaning of the language, might be so marginal as to permit more than half the wheels on a tandem axle to lock throughout the duration of a stop. The proposed amendment, however, was read by some manufacturers as expressly permitting systems in which half the wheels on each axle would not be sensed or monitored by the antilock controller or cycled by the antilock system. Such was not the intent of the proposal. It appears, on further review, that such systems are not currently in prospect. The agency has concluded that the better course is not to amend the "controlled lockup" language at this time, but to observe developments in the industry, with a view toward amending the requirements if subsequent events indicate a safety need.

S5.3.4 The notice had proposed increasing the release time for trailers from 0.50 second to 0.60 second. In the face of several objections to the proposal on the grounds that it ran counter to the need for coordination of braking between vehicles in combination, and on the basis of information indicating that the timing problem is solvable for trailers, the proposal is being withdrawn.

S5.4.1 The notice had proposed deleting the retardation force requirement, leaving it applicable only to towed vehicles. The change had been proposed as a result of the proposed amendment to the tractor test conditions whereby the tractor would be tested with a trailer. In the light of the comments, and of the continuance of the current tractor test conditions as an option, the NHTSA has decided not to adopt the proposed change.

S5.4.3 The notice proposed to delete the minimum recovery pressure requirement for brakes equipped with antilock systems, leaving the 20 psi minimum force level for other brakes. Upon further consideration, the agency has concluded that a minimum recovery force requirement should be retained for antilock equipped brakes, but at a level below 20 psi. The agency has determined that 12 psi is a minimum level that permits a greater variety of brake linings while retaining a residual protection against oversensitive brakes in the event of antilock failure. Accordingly, the agency adopts 12 psi as the minimum recovery force for antilocked brakes.

S5.6 The parking brake requirements of S5.6 had been one of the principal areas affected by the proposal. In addition to changes in the parking brake application requirements and deletion of the optional static pull test for parking brake holding ability, the notice had proposed new requirements for parking brake stopping capability. This latter proposal received almost unanimous criticism. Although the agency has not concluded that the proposal is without merit, the issues raised by the comments and the evident lead time problems associated with the proposal have led the agency to conclude that no further action should be taken without additional notice and opportunity for comment and that the effective date for any such requirement should lie beyond September 1, 1974.

Of the remaining changes to S5.6 proposed by the notice, only the exemption of converter dollies from the parking brake requirements is being adopted at this time. The proposed deletion of the optional static pull test of S5.6.2 has not been carried out, and the options of S5.6.1 and S5.6.2 will be retained. The proposed parking brake application requirements of S5.6.6 and S5.6.7, which had reflected amendments proposed to the emergency braking requirements of S5.7 are not being adopted at this time, pending further rulemaking on S5.7.

S5.7 The notice had proposed substantial revisions to the emergency braking requirements of S5.7, principally in response to a petition by ATA and to an earlier petition by Ford. The majority of the changes proposed in response to the ATA petition continue to be viewed favorably by the NHTSA. However, review of the comments suggests both that further refinements are necessary and that the proposed changes will require additional time for implementation. The agency is therefore deferring final rulemaking action on the aspects of S5.7 addressed by the ATA to a later date and will issue such changes as it may decide upon with an effective date beyond September 1, 1974.

Amendments to the emergency stopping distance requirements, presently contained in S5.7.2.3 of the standard, were proposed by two successive notices. In Docket 73-4, Notice 1 (38 F.R. 6831), the agency proposed a favorable response to a petition by Ford concerning the emergency stopping distances for short-wheelbase two-axle truck-tractors in the unloaded condition. When tested in this weight condition, truck-tractors are driven without a trailer—a condition in which they are seldom operated over the road. The effect of the proposed amendment would have been to permit a limited number of truck-tractors equipped with modulated emergency braking systems to stop in a somewhat longer distance than that permitted other vehicles with modulated emergency braking.

Comments to Docket 73-4 indicated that there were other vehicles whose braking systems were complicated by the shorter emergency stopping distance. In response to these comments, the agency proposed in Docket No. 73-13, Notice 1, to apply the longer stopping distances to other vehicles in the unloaded condition provided they were capable of stopping within the shorter distance with the assistance of the parking brakes. The comments to Docket No. 73-13 objected to the use of the parking brake in this fashion, and some asserted that if the longer distance were appropriate for some vehicles it should be appropriate for all. Upon review of the comments, the agency has decided against a general lengthening of emergency stopping distances. Upon weighing the rarity of truck-tractor operation without a trailer against the potential costs of modifying truck-tractors to meet the shorter stopping distance in that configuration, however, the agency has concluded that the longer stopping distances specified in Column 4 of Table II should be applicable to truck-tractors, regardless of weight distribution or number of axles, but that other vehicles should continue to meet the emergency stopping distances of Column 3 of Table II. Section S5.7.2.3 is amended accordingly.

S5.8 The notice had proposed to transfer the emergency braking capability requirement for trailers from S5.8 to S5.6.7. Until such time as the agency decides to adopt S5.6.7, S5.8 will be retained. To provide emergency capability for converter dollies, in the absence of mandatory parking brakes for them, the NHTSA has amended the section to provide for application of the dolly's service brakes in the event of complete air pressure loss in the control lines. This system is presently installed in virtually all dollies, as a result of regulations issued by the Bureau of Motor Carrier Safety (49 CFR 393.43) and is considered to be a practicable substitute for the parking brakes in emergency situations.

S6.1 A number of revisions to the test conditions of S6.1 were proposed. These revisions are adopted in substance, with some changes in structure and in section numbering. The new truck-tractor test condition, whose insertion as S6.1.2 had caused confusion as to the fate of the old S6.1.2, has been adopted as S6.1.10, thereby leaving the current sections S6.1.2 to S6.1.9 with their present numbering.

S6.1.8 The road test burnish procedures proposed in the notice are being adopted as an optional procedure for the period September 1, 1974, to September 1, 1976. After September 1, 1976, the new burnish procedure will replace the older procedure as the only burnish prescribed for road tests. This two-step arrangement appears necessary to permit manufacturers whose testing to date has been conducted with the current burnish procedure, and who need additional time, to phase in the new procedure.

S6.1.10 A similar phase-in has been found necessary for the new tractor test conditions. Several manufacturers had stated that their evaluation programs had been conducted without trailers and that retesting would be necessary in order to certify their vehicles under the new conditions. The new conditions are therefore adopted as an option for the period September 1, 1974, to September 1, 1976. During this period a manufacturer may choose to test his vehicles under either loading condition, and such tests as the NHTSA conducts will be in the loading condition chosen by the manufacturer for the vehicle under test.

S6.1.10.1 The control trailer to be used under S6.1.10 is specified as conforming to Standard No. 121.

S6.1.10.2 The center of gravity of the loaded trailer is specified as being at a height of 66±3 inches above the ground. There was a variety of opinion in the comments as to how high the center of gravity should be, but upon reviewing the comments the agency has concluded that the 66±3 inch range originally proposed is reasonably representative of loading conditions. Axle load shift due to the rake angle of the trailer bed does not appear to be a problem in that each axle of the trailer is loaded to its GAWR when the trailer is connected to the tractor.

S6.1.10.3 and **S6.1.10.4** In response to comments suggesting that the lengths and weight ratings of the trailers specified in the proposal were not those in most general use, the agency has increased the length of the trailer specified in S6.1.10.3, reduced the length of the trailer specified in S6.1.10.4, and lowered the gross axle weight rating for each trailer.

S6.1.10.5 The loading condition of the trailer for tests of the tractor's brakes is substantially the same as that proposed in the notice. The tractor's fifth wheel does not have to be adjustable, as some comments inferred, but if it happens to be adjustable it must be adjusted to produce the specified weight distribution. The axle loads are to be measured at the tire-ground interfaces, in response to comments that the former reference to the "force transmitted to the tractor axles through the kingpin" was not clear as to the method of measurement.

S6.1.10.6 and **S6.1.10.7** These sections are designed to establish performance specifications for the trailers to be used for truck-tractor testing. They are not intended as performance requirements for trailers, but only as test equipment specifications for the tractor tests. The trailer loading condition specified is somewhat different from that used in testing the performance of the tractor, because the tests are aimed at isolating the performance of the trailer brakes. The location of the fifth wheel is specified as the position determined under S6.1.10.5, but the trailer is loaded so that its axle is at its gross axle weight rating and its kingpin is at unloaded weight.

The actuation and release times specified for the trailer in the evaluation tests were questioned by several comments. It may be necessary, in some cases, for a special valve to be installed on the tractor if the tractor's system is too slow to actuate the trailer's brakes in the time specified. The purpose of the timing specification is simply to remove the tractor's performance as a factor in the trailer brake evaluation. When the trailer is used in tests of a tractor pursuant to S5.3.1 it will, of course, be connected to the tractor's normal control system.

In addition to specifying the same loading in S6.1.10.7 as in S6.1.10.6, the ratio applied to determine the trailer's stopping distance under S6.1.10.7 has also been revised to conform to that used in S6.1.10.6. To accommodate tractors that are not capable of 60-mph speeds, each section now specifies that the trailer is tested at the speed at which the tractor for which it will be used is tested.

S6.1.11 and **S6.1.12** These sections relate to special drive conditions and the position of liftable axles, and are adopted as proposed.

S6.1.13 This new section was proposed to establish performance requirements for the trailer timing test rig specified in Figure 1. In the light of objections in the comments to the performance levels specified, the agency is deferring final rulemaking at this time and will issue such changes as it may decide upon with an effective date beyond September 1, 1974.

The tables and figures proposed for adoption or amendment by the notice are adopted as proposed, except for the omission of the parking brake dynamic test from Table I.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 121, *Air brake systems* (49 CFR 571.121), is amended . . . .

Effective date: September 1, 1974.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on December 20, 1973.

James B. Gregory
Administrator

39 F.R. 804
January 3, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 2)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, in response to several petitions for reconsideration of amendments to the standard published January 3, 1974 (39 F.R. 804), and after consideration of comments on a proposal published March 1, 1974 (39 F.R. 7966). A notice of proposed rulemaking has been issued separately to propose modification of the standard as it applies to trailers.

Reconsideration of Amendments—73–13; Notice 3

The amendments under reconsideration concern emergency stopping distance requirements for truck tractors, parking brake requirements for trailer converter dollies, recovery requirements for antilock-equipped brakes, a new test condition for loaded truck-tractors, special test conditions for certain drive and axle configuration, and a new burnish condition for road tests. Several manufacturers commented on issues which lie beyond the scope of those amendments and are therefore inappropriate for treatment in this response. Wagner Electric and Midland-Ross' petitions to amend S5.1.2.1 and S5.2.1.2 (Midland also petitioned on S5.1.2.2 and S5.2.1.3) and Wagner's petition to modify Table III retardation values will therefore be considered as petitions for new rulemaking to be answered in a separate notice.

The American Trucking Association (ATA) requested reconsideration of NHTSA's decision to permit either automatic or modulated emergency brake systems as options while further consideration of the modulated system takes place. As stated in Notice 3, the NHTSA has concluded that some aspects of the system may need refinement and that all vehicle manufacturers cannot in any case make all their vehicles conform to modulated brake system requirements by the standard's effective date. Accordingly, while the majority of the changes proposed in response to the ATA petition continue to be viewed favorably, for the present ATA's petition is denied.

Wagner Electric and General Motors objected to the retention of brake retardation force requirements for towing vehicles as redundant in view of the stopping distance requirements which also apply to them. The NHTSA proposed deletion of these dynamometer requirements previously and, having considered the latest submissions and information, hereby amends S5.4.1 to delete towing vehicles from the standard's requirements. The NHTSA has tentatively concluded that the stopping distance requirements can establish satisfactory brake balance between towed and towing vehicles, and that the cost of dynamometer testing is not justified by corresponding safety benefits. It should be noted that the dynamometer test may be reinstituted if experience demonstrates its need.

Fruehauf, in a late submission to this docket and in other docket comments, has emphasized the importance to lateral stability of a slower release time for trailers. A 0.60-sec maximum release time proposed in Notice 1 was not acted on in Notice 3 in the belief that it ran counter to the need for coordination of braking between vehicles in combination, but further study has persuaded this agency that a slightly slower release time for trailers is not detrimental to safe operation of combination vehicles. S5.3.4 has been amended accordingly.

General Motors and the Motor Vehicle Manufacturers Association (MVMA) petitioned for deletion of the 12 lb/in^2 minimum pressure requirement for brakes controlled by an antilock system. The purpose of the minimum pressure is to eliminate oversensitive brakes because of the difficulty in modulating them. The lower value was established for antilock-controlled brakes on the assumption that a functioning antilock would normally compensate for oversensitivity. A residual value was retained in the event of antilock failure, not to compensate for driver surprise, as assumed by the MVMA, but rather to aid the driver in his efforts to carefully modulate a sensitive brake. The NHTSA has seen no evidence to support the assertions made by MVMA that this requirement could downgrade stopping performance. Except for General Motors' request to clarify antilock "control" in this section, the petitions to amend S5.4.3 are accordingly denied. S5.4.3 is modified to substitute "subject to the control of" in place of "controlled" to make clear that the antilock need not be activated.

General Motors and the MVMA objected to the test condition where a vehicle "is loaded to its gross vehicle weight rating, distributed proportionately to its gross axle weight ratings", arguing that this distribution formula could lead to overload of one or more axles. The General Motors illustration indicates a misunderstanding of the section's wording. The phrase "is loaded to its gross vehicle weight rating" describes a weight condition, that of the fully loaded vehicle, and the provision requires that this weight be distributed in proportion to the gross axle weight ratings. General Motors and the MVMA apparently interpreted the phrase to describe only that portion of the gross vehicle weight rating which "is loaded" on an unloaded truck to bring its weight up to GVWR. The condition states that what is distributed proportionately is the gross vehicle weight *rating* (*i.e.* the weight of the loaded vehicle), and not just that portion of the rating that constitutes the "load." There is no mathematical possibility of overloading an axle under this condition, since the GVWR must be no more than the sum of the GAWR's.

Ford stated with respect to S6.1.10.5 that "on some vehicles, it may not be possible to adjust the fifth wheel to a position in which the tractor can be loaded to GVWR without exceeding the GAWR of one axle." It may be that Ford's problem arises from the same misunderstanding described above with respect to GM and MVMA. To the extent, however, that the Ford petition implies that a manufacturer can establish a GVWR for a truck tractor which can not be attained without axle overload, the petition is based on a misconception of GVWR and is therefore denied.

Wagner Electric requested that the loadings in S6.1.10.6 be made uniform with S6.1.10.5 and S6.1.10.7. These loadings are not intended to be uniform, however, because the first condition specifies loading for purposes of truck-tractor testing, while the latter two conditions only establish test equipment specifications for the "control trailer test device" which is used in testing the truck-tractor. S6.1.10.6 and S6.1.10.7 loadings differ so that the service brake and emergency brake capabilities of the control trailer are separately designed to place greater demands on the truck tractor's service braking system than its emergency braking system. The calculations are based on an evaluation of the capacity of the brakes that are expected to be placed on production trailers in accordance with the dynamometer test requirements.

For the benefit of manufacturers who mistakenly consider these test conditions to be minimum performance requirements, it should be emphasized that the S6.1.10.6 and S6.1.10.7 values are conditions, i.e., characteristics of the control trailer test device which must be duplicated as closely as possible for testing. As with any other test device characteristic, to the degree that the control trailer can not produce exactly the right stopping distance, the certifying manufacturer should ascertain conformity of his vehicles under slightly more adverse conditions than those specified, in this case by slightly reducing the trailer brakes' capacity (to stop in the specified distance).

General Motors objected that the lighter control trailer capacities (18,000 and 32,000 pounds in place of 20,000 and 40,000 pounds) specified in the amendment would lower control trailer performance and thereby increase the performance required of truck tractors. The change was made to specify commonly used trailers, to aid manufacturers in meeting the September 1, 1974, effective date. The NHTSA continues to consider the increased availability of test devices to be more significant to promulgation of a fully satisfactory final rule than the small quantitative change noted by General Motors, and their petition is therefore denied.

General Motors and the MVMA requested specification of test load density to resolve difficulties in establishment of the "worst case" center of gravity height when testing trucks. Specification of a test load density, however, is unnecessary. The manufacturer of a truck or incomplete vehicle should establish the limits of placement of the load center of gravity as a part of his design considerations, to be specified in the Part 568 document for an incomplete vehicle or in his instructions to users in the case of a completed one. This establishes an envelope within which the vehicle is certified to comply with Standard 121 under full load. Once that envelope is established, the appropriate load densities to test the vehicle's conformity can be derived from it.

Several petitions were received with regard to brake burnish procedures. The MVMA and Ford requested reinclusion of language found in the proposal that specified an acceleration procedure for vehicles unable to reach the specified speed in one mile. General Motors submitted minor changes of an editorial nature and new language to specify an increased deceleration rate for vehicles unable to reach the specified speed in one mile. The NHTSA has concluded that language which appeared in the proposal and reflects current SAE procedure should be adopted. The General Motors increased deceleration method represents a new procedure which has not been evaluated by the NHTSA or proposed in any previous rulemaking. The suggestion of 50 snubs before allowing a cooling period is also a new General Motors proposal which the NHTSA has not had the opportunity to evaluate. With the exception of one recommendation, General Motors' editorial suggestions are adopted to be consistent with the titles in Table IV. The word "maximum" was deleted from S6.1.8.1 at the request of several manufacturers because it was inappropriate to the specification of temperature range.

Ford requested the addition of a burnish procedure for parking brakes which do not utilize the service brake components. Language has been added to specify a burnish procedure for these brakes in accordance with the manufacturer's recommendations.

Two other issues were raised with regard to the road test conditions. To answer Wagner Electric's petition for clarification of S6.1.10.7, the "valve controlling the trailer brakes" may or may not be part of the normal commercial system of the tractor depending on whether or not the normal system can provide the timing specified. The purpose of standardizing timing specifications is simply to remove the tractor's performance as a factor in the test trailer brake evaluation. When the trailer is used in tests of a tractor pursuant to S5.3.1, it will, of course, be connected to the tractor's normal control system.

General Motors questioned the safety benefit of wheel lockup requirements for liftable axles on buses equipped with two non-steerable axles if other axles other than the liftable axle can themselves meet the stopping distance requirements. The agency considers the controlled performance of the liftable axle to be of considerable benefit for added stability under braking conditions other than straight ahead braking required by the standard, and on this basis it denies the GM petition.

In other areas of the standard, General Motors petitioned for longer emergency stopping distances for all vehicles, reasoning that an exception to the values for truck-tractors in an unloaded condition (based on rarity of operation) could be as easily justified for the rare emergency stop situation of any vehicle. The rationale ignores the fact that the emergency values were established in the first place with the rarity of such occurrences in mind, and that the exception is posited on the combined rarity of unladen truck-tractor operation involved in an emergency situation. The problem of testing chassis-cabs can be met by specifying conformity to S5.7.2.3 with a specified weight on the rear axle representing the vehicle body weight. General Motors' petition to apply column 4 values to all vehicle emergency stopping distance requirements is therefore denied.

Wagner Electric petitioned to modify the wording of S5.8 concerning emergency application of trailer converter dolly service brakes so that the wording would be identical to Bureau of Motor Carrier Safety regulations (49 CFR 393.43). Wagner's proposed wording, however, applies to towing vehicle performance, where the triggering signal is a low, fixed air pressure, and the wording would not be appropriate for trailer performance, where the triggering signal is a venting of the supply line to the atmosphere. The S5.8 language is actually compatible with § 393.43(b), in that BMCS calls for towing vehicles to have an automatic means of activating the emergency features of the trailer air brakes, and S5.8 calls for compatible automatic features on the trailers. Wagner's petition is therefore denied.

General Motors asked whether the S5.4 requirement that brake assemblies meet tests in sequence actually exempts some brakes from all three tests if they are elsewhere exempted from the first. Paragraph S5.4 does not exempt any brake assemblies from any requirement. The brakes on a vehicle which does not have to comply with S5.4.1 must comply with S5.4.2 and S5.4.3.

Several comments requested correction of the omission of the words "in the service brake system" from S5.7.2.3 as published in Notice 3. The omission was inadvertent and has been corrected.

General Motors requested an indication that stopping sequence steps 2 and 3 in Table I apply only to truck-tractors. The steps have been changed to indicate that these steps apply only to truck-tractor testing by means of a control trailer. As for the objection that S6.1.10.7 implies the emergency system of a truck-tractor must control the trailer spring brakes, S6.1.10.7 has been clarified by the addition of a qualifying phrase. S6.1.10.6 and S6.1.10.7 have been further clarified by adding headings to indicate that they are test equipment specifications.

In a separate submission to Docket 73-13, Wagner Electric requested clarification of the trailer test rig timing issue, which had been reserved in Notice 3 as a candidate for adoption at some later date. Midland-Ross also raised the issue with regard to a requested modification of Figure 1. The petitions pointed out that an NHTSA test showing a failure would be inconclusive if it were compared to manufacturer testing conducted on a faster rig, and showing conformity. The remedy is to specify "legal baseline" actuation and release times, so the manufacturer will know the precise conditions under which his equipment must meet the requirements, and both government and industry testing can be conducted so as to produce conclusive results. The NHTSA therefore establishes the actuation and release values proposed in Notice 1 with minor modification. They will not become effective until September 1, 1975, to maintain the validity of testing already conducted. The values are set at two-significant-figure accuracy in agreement with Wagner that the values should match the actual trailer performance values. Because the actuation time is lowered to 0.06 seconds, the NHTSA may find it necessary to improve its test rig's speed by removing the tractor protection valve. Therefore, the valve has been made optional. The performance of the test device had been modified from the original proposal so that initiating signal points are the same as for the actual performance tests, and so that initial release pressure agrees with the 95-psi requirement of the performance tests.

Other issues raised by Wagner and Midland-Ross in petitions to Notice 3 will be answered in a later notice.

March 1, 1974 Proposals

The NHTSA proposed modification of the standard's effective date, brake actuation times, and road and dynamometer tests as they apply to the service brake system and emergency stopping performance of all vehicles subject to the standard except trailers (39 F.R. 7966, March 1, 1974). The proposals would have affected vehicle types separately to reflect the particular problems faced by fire fighting vehicles, "special permit" vehicles, on/off-highway vehicles, and standard highway trucks and buses. Manufacturer concern centered on the availability of components to meet the standard by September 1, 1974, and the reliability of the antilock systems which will be utilized by most manufacturers to meet the requirements. Having carefully considered the comments submitted in response to this proposal, the NHTSA hereby delays the standard's effective date for trucks and buses to

March 1, 1975, and establishes interim requirements for particular categories of vehicles essentially as they were proposed.

The limited delay of effective date does not satisfy the requests of Ford and General Motors, who argued for a complete delay of the standard for one year, followed by limited implementation of the standard. Other comments, including those of Chrysler and Rockwell International, asked for significant delays of one year or more based primarily on component shortages which will be discussed separately with regard to the specific problems of separate vehicle types.

Ford argued that the stopping distance requirements mandated high-torque front brakes that could degrade suspension and steering characteristics of some vehicles to an unsafe level. Their submission to the docket and materials submitted in conjunction with a presentation to the NHTSA on March 28, 1974, included evidence of erratic handling and suspension distortion in high- and low-speed spike stops on the proving ground by short wheelbase trucks. The American Trucking Association joined Ford in questioning vehicle handling under the standard's requirements.

Review of the Ford submission indicates that unmanageable suspension problems of this nature are generally encountered in short-wheelbase trucks with suspensions that have not been adequately modified for Standard 121 brakes. Other manufacturers have indicated in some cases that their solution to such severe instability has been a major redesign of the front axle and suspension system, or a decision to withdraw vehicles with especially short wheelbases from their product line. The NHTSA concludes that sufficient lead-time has been made available to all manufacturers to correct the steering and suspension problems of reasonably-designed short-wheelbase vehicles, and that vehicles with wheelbases that are so short, and centers of gravity that are so high, that they cannot stop safely in the stopping distances specified should not be on the highway.

General Motors and other truck manufacturers argued for delay of the standard's effective date for one year to permit additional field testing of the reliability of current antilock devices. The likely effect of such a delay, however, would be further delay in the availability of production antilock components. One air brake equipment supplier believes "continued development will eventually improve their (antilock systems) overall performance but most of these changes for refinement in electronics, improved pneumatic/electronic response, durability, sensor standardization and design standards require the normal evolution of field experience under real life conditions, using mass produced parts for a genuine field history."

The reliability of antilock systems can presently be judged on the basis of the performance of systems that are already in fleet test programs (and to a lesser extent by evaluation of antilock systems used for many years in passenger cars). One truck manufacturer has reported average miles between failures on fleet testing to be 89,000 miles (176,000 miles in operations within the continental United States). A manufacturer of antilock equipment reported in February 1974 that over 8,000 of its air brake skid control systems are in field use, with excellent reliability experienced. Neither this manufacturer nor any other has reported any highway accident which was attributed to a malfunction of the antilock system.

General Motors included in its list of antilock failures incorrect test procedures, missing fuses, and warning light malfunctions. While these are not insignificant concerns, they are an indication that unfamiliarity with the new system accounts for some of the malfunctions experienced in test programs. In addition, other malfunctions reported by General Motors are believed to be the result of systems being "added on" instead of being designed into the vehicles.

General Motors and Ford reported accidents in their proving ground tests, which they believe illustrate what might happen if an antilock system malfunctions in service. The NHTSA has studied the accident information which was submitted and has concluded that these accidents occurred as a result of rear wheel lockup during panic-type, full brake application and would also have occurred if the vehicles were not equipped with antilock systems. The NHTSA concludes that the reliability of antilock systems is such that their introduction will contribute to motor vehicle safety.

Both the Ford and General Motors recommendations, as well as the other petitions which requested delays substantially greater than those proposed by the NHTSA, are excessively broad in that they would postpone all the safety benefits of the standard, because of specific problems in limited areas. The NHTSA proposal, by comparison, proposes only those modifications which are essential to implement the standard as rapidly and fully as possible.

Because there was only a short interval between the latest proposal and the effective date of the standard in which to implement any modification of the standard, the proposal included a blanket 4-month delay of the standard's effective date for all affected vehicles. International Harvester, the largest manufacturer of air-braked vehicles that commented on the proposal, indicated agreement with the 4-month delay and stated their intention to build vehicles which comply with the standard after that date. General Motors noted the possibility that axles and the larger foundation brakes necessary to meet the standard would be available. The major supplier of axles to the truck and bus industry has estimated that, with no margin for error, some axles could be ready for January 1, 1975. The NHTSA has evaluated the current industrial shortage and leadtime problems precipitated by factors beyond manufacturer control and has concluded that a March 1, 1975, effective date as it applies to powered vehicles is necessary to allow the orderly implementation of Standard No. 121. The NHTSA cannot agree with Blue Bird Body Company that smaller manufacturers should automatically be granted a year to meet the standard following the availability of production components for Standard No. 121.

The NHTSA has also determined that the proposed requirement that the test reservoir pressure reach 60 psi in 0.25 sec cannot be implemented prior to this effective date, and the proposal is therefore withdrawn. The modification of systems to achieve this requirement could negate the compliance test data which has been accumulated by many manufacturers.

Most comments which requested a longer delay of the effective date or more specific relief were addressed to the problems of specific vehicle types. There were no specific comments, however, on the proposed 1-year delay in the applicability of the standard to fire fighting vehicles. Accordingly, the standard is amended to apply to fire fighting vehicles only after September 1, 1975.

The comments on "special permit" vehicles (defined in the proposal having a 108-inch overall width or a 24,000-pound gross axle weight rating (GAWR), centered on the inadequacy of the definition when applied to "heavy hauler" trailers. Trailers are dealt with in a separate notice of proposed rulemaking published in today's *Federal Register*. The few comments addressed to "special permit" trucks favored the September 1, 1976, effective date, but suggested more time might be necessary to acquire the necessary components because of their low priority in suppliers' engineering programs. At this time the NHTSA amends the standard to grant these vehicles a September 1, 1976, effective date. Any supply problems beyond that will be considered at a later time as they arise.

On/Off-Highway Vehicles: Comments on the proposal to substitute dynamometer requirements for stopping distance requirements until September 1, 1975, for trucks that have a front steerable axle with a GAWR of 16,000 pounds or more, or a front steerable drive axle, fell into two groups. Comments either argued that the delay was insufficient, particularly with regard to front steerable drive axles, or they objected to particular aspects of the relaxed interim requirements.

The NHTSA has decided to maintain the September 1, 1975, date for the full stopping distance requirements. An evaluation of all available information in this area indicate that air brake components will be available to meet the required level of performance for vehicles in this category.

Manufacturers raised objections to the proposed interim requirements as they were expressed in S5.3.1.2 and S5.7.2.3.1. Wagner Electric, General Motors, White, and Diamond Reo requested clarification that the S5.3.1.2 requirement would apply to "straight" trucks as well as towing vehicles. The language of S5.3.1.2 makes clear that any trucks in the described category need not meet certain stopping distance requirements if their brakes conform to the formula in S5.4.1.

Wagner, Mack, and Abex questioned the proposed requirement that the dynamometer values be applied to each axle system separately, instead of being summed for the entire vehicle braking system. The axle-by-axle dynamometer approach was specifically included in the proposal to ensure that brakes would be provided on the front axle and not to minimize braking on the rear axle. Therefore this section is modified to require a certain level of performance for the front axle and a sum total of performance overall. If a specific value were not required for the front axle, manufacturers would be tempted to make minor modifications of present front axle systems and thereby avoid the opportunity to gain experience with the newer, stronger foundation brakes and axles.

The language "the brakes on each wheel" in S5.3.1.2 confused Abex with regard to the dynamometer test requirements. To clarify the requirement while in no way changing it, the wording is amended to "its brakes."

In answer to Wagner's request for a definition of "axle system", the term is used in the same sense as it is used in the definition of GAWR found at 49 CFR § 571.3. "Axle system" is used instead of "axle" to avoid confusion in situations where a suspension system does not employ an axle. The term has not created difficulty in the GAWR definition.

The S5.7.3.2.1 requirement for dynamometer testing in place of emergency stopping performance testing parallels the S5.3.1.2 requirement. General Motors has pointed out, however, that dynamometer testing of spring brakes often found in emergency brake systems is impracticable. Wagner also points out that the requirement can be viewed as redundant in view of S5.3.1.2. In view of these objections, the NHTSA concludes that retention of the emergency stopping requirement (except for the stopping distance) would be preferable to a dynamometer requirement. For the interim period, therefore, the vehicle will be required to come to a stop within the 12 foot lane using its emergency braking system.

Highway Trucks and Buses: For powered vehicles that do not fall in the categories treated above, the proposal would have lengthened stopping distance requirements 5 percent to compensate for the variations expected in early production components that affect stopping performance. Most manufacturers argued that the 5 percent longer distances would be required for the indefinite future, because production variations would continue to affect performance significantly. The NHTSA established the stopping distances on the basis of the ability of available equipment, and expects that experience in the production of these components will lead to predictable quality and the assurance that a vehicle will in fact perform as well as it is designed to.

White Motor Company suggested a clarification of S5.3.1.3 and S5.7.2.3.2 to make clear that the test procedures for the proposed Table V stops are identical to those in S5.3.1 for the Table III stops. The change has been made without in any way changing the requirements.

Other Issues: Two proposals which affected most trucks and buses were the brake actuation time of 0.35 sec and the option of a manual pressure reduction valve to limit air pressure to the front axle. Nearly all manufacturers supported the 0.35-sec actuation time for trucks and buses and requested that it also be extended to trailers. The NHTSA amends the standard as proposed for truck and bus brake actuation. Trailer brake actuation requirements will not be changed, however, in light of the imminence of the effective date and the consequent need for stability in the standard.

The manual pressure reduction valve proposal was not supported as expected. Even Ford and General Motors, who questioned the safety of high-torque front brakes, did not agree that the valve would have a positive safety benefit. In view of the sharp disagreement in the comments over the usefulness of the valve in the hands of different drivers, the proposal is withdrawn.

In the course of their comments on the proposal, several manufacturers and suppliers indicated uneasiness about the policy of the NHTSA with regard to isolated failures of components that have been certified as complying with Standard No. 121. Some comments expressed a belief that the NHTSA was adopting or announcing a new policy regarding compliance, with reference to a panel discussion at the February 25, 1974, meeting of the SAE in Detroit. The remarks in question, by an NHTSA Assistant Chief Counsel, were to the effect that the agency expects that each manufacturer will design his vehicles and his test program so as to constitute due care that each of his vehicles complies with the standard. That is not a new policy, however, but merely a statement of the requirements of the National Traffic and Motor Vehicle Safety Act, which has been followed continuously by this agency. The NHTSA has avoided a rigid position that each failure necessarily constitutes a violation of the Act, just as it has the position that some percentage of failures is automatically "allowable." What constitutes due care in a particular case depends on all relevant facts, including such things as the time to elapse before a new effective date, the availability of test equipment, the limitations of current technology, and above all the diligence evidenced by the manufacturer.

All interested persons should note that, although a proposal was necessary with regard to changes for trailer manufacture, the NHTSA does not intend to make any other amendments of Standard 121 before its effective date.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective Date: September 1, 1974, for trailers; March 1, 1975, for trucks and buses.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718; 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on May 14, 1974.

James B. Gregory
Administrator

39 F.R. 17550
May 17, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74-10; Notice 4)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, to delay the effective date of the standard as it applies to air brake-equipped trailers until January 1, 1975.

The January 1, 1975, effective date was proposed in a notice published May 17, 1974 (39 F.R. 17563) which invited comments on the proposal until June 17, 1974. On the basis of urgent requests by manufacturers and the Truck Trailer Manufacturers Association, a new comment closing date of June 4, 1974, was established for the effective date issue (39 F.R. 18664, May 29, 1974). The separate issue of a new "heavy hauler trailer" category is still subject to the June 17 date for comments, and further action will be decided on after that date.

Only three commenters, out of the fifty who responded, opposed the 4-month postponement. These three were suppliers to the trailer industry who claimed that they were ready to provide the needed components by September 1, 1974, and stated that a delay in the effective day would entail additional costs to them. The NHTSA finds, however, that the September 1, 1974, date does not provide sufficient time for an orderly transition to production of the trailers with the new components, and that a delay until January 1, 1975, is therefore in the interest of motor vehicle safety.

In consideration of the foregoing, the effective date of Standard No. 121 (49 CFR 571.121) is changed from September 1, 1974, to January 1, 1975, as it applies to trailers.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on June 6, 1974.

Robert L. Carter
Acting Administrator

39 F.R. 20380
June 10, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 5)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.121, to delay the effective date for a category of specialized trailers whose configuration makes compliance with the standard particularly difficult until September 1, 1976. A new definition is added to the standard to define the specialized "heavy hauler trailer" category.

The definition and effective date were proposed in a notice published May 17, 1974 (39 F.R. 17563). The proposed definition read:

> "Heavy hauler trailer" means a trailer with one or more of the following characteristics:
>
> (1) Its brake lines are designed to adapt to separation or extension of the vehicle frame; or
>
> (2) Its body consists of a platform whose primary cargo-carrying surface is not more than 40 inches above the ground in an unloaded condition.

None of the comments directly addressed to specialized trailers objected to the 1976 date.

Wagner Electric suggested that the definition could be misconstrued to include trailers with bodies that consist of a cargo-carrying surface and sides and a header. It does appear that the definition can be more specifically stated, permitting only a header for safety purposes, and sides of a temporary nature. The definition has been modified accordingly.

Some comments recommended broadening the reach of the definition to higher trailers. Nabors suggested a specific exemption for pole trailers. Kornylak requested exemption of its Stradolift vehicle, and Bankhead requested exemption of auto-hauling trailers.

The suggestions to expand the definition to specific trailer types would broaden the exemption beyond what is necessary to implement the standard. The definition presently reflects the necessary design characteristics of specialized trailers which, as a whole, require more development before they can comply with the standard. Hauling automobiles, for example, does not require 15-inch wheels. A pole trailer which is not extendable does not require longer brake actuation and release times than the standard highway van.

Other comments recommended raising the 40-inch bed limit to accommodate more vehicles. The NHTSA has concluded that trailers with beds higher than 40 inches (including trailers whose beds are below 40 inches over the wheels but higher than 40 inches over the fifth wheel) can accommodate the new larger brake packages available at this time.

In consideration of the foregoing, Standard No. 121 (49 CFR § 571.121) is amended by a modification of the paragraph on the applicability of the standard and by the addition of a new definition. . . .

Effective date: January 1, 1975. It is found that this amendment causes no additional burden to manufacturers and, because the general effective date of the standard for all trailers is January 1, 1975, this delay of effective date for certain trailers must be effective sooner than 180 days of issuance and no later than January 1, 1975.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on July 30, 1974.

James B. Gregory
Administrator

39 F.R. 28161
August 5, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74-10; Notice 6)

This notice responds to six petitions for reconsideration of recent amendments to Standard No. 121, *Air brake systems*, 49 CFR 571.121, which established a March 1, 1975, effective date for trucks and buses, and optional interim requirements until September 1, 1975, for trucks with certain heavy or front steerable drive axles. In addition, this notice also responds to several questions on the burnish procedure recently raised by International Harvester.

The NHTSA established the March 1, 1975, effective date for trucks and buses after comprehensive consideration of numerous petitions from manufacturers and users of air brake-equipped vehicles (39 F.R. 17550, May 17, 1974). Manufacturer concerns centered on the availability and reliability of components involved in the new brake systems, particularly antilock devices, and on leadtime necessary to modify vehicles to accept these components.

Ford Motor Company is the only manufacturer of air brake-equipped trucks which petitioned for reconsideration of the March 1, 1975, implementation date for the standard's basic provisions. After the time for petitions for reconsideration had closed, Chrysler Corporation reported on an accident which occurred during certification testing of a vehicle equipped with antilock devices, and urged the delay of Standard No. 121 for an indefinite period. The American Institute of Merchant Shipping also requested an indefinite delay in the standard's implementation.

Ford petitioned for a further 6-month delay in the standard as it applies to truck-tractors, and a one and one-half year delay as the standard applies to other trucks and buses. Ford asserts that the suspension and brake modifications necessary to meet the dry-stopping distance requirements will compromise vehicle handling and stability, increase the danger of load shifts, and force the introduction of antilock devices before Ford considers them reliable. The requested extension would be used to evaluate the effect of the new componentry on overall safety.

The issues in the Ford petition have been carefully considered by the NHTSA in the process of rulemaking and, with the exception of load shifting, were addressed in the preamble to the amendments which established the March 1, 1975, date. The NHTSA has reviewed each of Ford's concerns, and concludes that implementation of the standard as scheduled for trucks and buses is reasonable, practicable, and meets the need for motor vehicle safety.

With regard to the handling and stability problems experienced by some short-wheel-based vehicles in meeting the stopping distance requirements, the NHTSA maintains its determination that adequate time has been made available to make the major redesign necessary in some vehicles, or to make the decision to discontinue the production of models which are simply too short to meet the requirements despite design changes. International Harvester, in its comments on the rulemaking, indicated that it had been ready to meet the proposed January 1, 1975, effective date and would actually suffer economic losses in waiting for the March 1, 1975, implementation.

The availability and reliability of antilock systems which will be used by many manufacturers in meeting the requirements was questioned by Ford in its petition. In response to Ford's assertion that a manufacturer's report on field experience with 8,000 antilock units does not appear in the record, a letter from Kelsey-Hayes (February 1, 1974) containing this information was placed in the NHTSA Docket Section before March 1, 1974. The NHTSA continues to monitor antilock production and testing and cannot agree that the evidence indicates antilocks will decrease the safety of the new trucks in highway operation. Since May, the NHTSA engineering staff has visited six of the seven major antilock manufacturers to discuss antilock reliability and availability. At least half of these manufacturers pointed out that their plants were prepared for full production to meet the September 1, 1974, date, and that they had had to delay production schedules because of the six-month delay. Low volume production is presently available to vehicle manufacturers for their testing and evaluation.

Concerning antilock reliability, a substantial amount of proprietary information was reviewed as well as the publicly-known information that no highway accident has been attributed to the failure of antilock devices. Kelsey-Hayes pointed out that it is selling approximately 250 axle units each month for retrofit. Following these visits, the NHTSA sent the seven major antilock manufacturers requests for reliability data under its investigatory authority, which will become part of the record although it may be of a proprietary nature which would justify not making it public. This data will show millions of axle miles of antilock operation with a malfunction rate comparable to other equipment presently in highway service, and no highway accidents attributable to the device.

Chrysler Corporation reported on a proving-ground accident on May 16, 1974, in which an antilock-equipped truck rolled over after its rear wheels locked and caused skidding during a stop from 60 mph. The manufacturer of the antilock system reported that the device functioned as it was designed to but in response to a false signal. The important point, however, as noted in the May rulemaking, is that the accident occurred as a result of rear-wheel lockup during a panic-type, full brake application that would also have occurred if the vehicle had not been equipped with antilock. In other words, a panic stop always involves the risk of uncontrolled skid due to lockup, and the presence of the antilock only improves the chances of a safe stop in the vast majority of instances in which it functions properly.

Ford requested an interpretation of S5.5.1 of the standard that would permit use of a pressure limiting valve to the front axle that operates when it senses electrical failure of the antilock system. The NHTSA has advised Ford (and Bendix Corporation) that S5.5.1 does not prohibit use of such a valve designed to operate in the event of electrical failure.

Ford also raised the problem of load shift under heavy braking. The NHTSA has considered the effects of the standard and notes that, under normal circumstances, stops will continue to be made at the same deceleration as in the past, consistent with driver comfort and load stability. Only in emergency situations will the full torque of the new brakes be utilized and in this event, the NHTSA concludes that the shorter stopping distances outweigh the possible safety problem of load shift.

The Ford petition pointed out that any failure of component manufacturers to supply the new 121 components would make compliance with the standard impossible. As of this date the NHTSA finds that supplier production is on schedule and will provide components on time. As recently as July 26, 1974, Rockwell International assured the NHTSA that its production is on schedule.

For these reasons the Ford petition and Chrysler request are denied. The NHTSA would like to establish the issuance of this notice as the final form of Standard No. 121 with regard to its effective date and the stopping distance requirements, for purposes of review under § 105(a)(1) of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. § 1394). Thus, while several areas treated later in this notice will be subject to further reconsideration, the effective dates and stopping distance requirements will be final as to any person who will be adversely affected by them.

While International Harvester supported the March 1, 1975, date for standard highway trucks and buses (it would have preferred a January 1, 1975, date), they did petition for reconsideration of the NHTSA decision to apply the full stopping distances to vehicles equipped with front steerable drive axles after September 1, 1975. White Motor Company and Diamond Reo Trucks, Inc., also petitioned for 1 year's delay in implementation of the full requirements for these axles.

The majority of front steerable drive axles are found on vehicles which use the road regularly at highway speeds and which require the same stopping capability as lighter vehicles. In most cases, their non-planetary construction permits an uncomplicated adaptation to the standard's torque requirements. Furthermore, one vehicle manufacturer indicates that it has successfully redesigned steerable drive axles in the 18,000- to 23,000-pound GAWR range to meet Standard No. 121. White, International Harvester, and Diamond Reo state that the lighter axles in this category are unavailable, but not technically unfeasible. The unavailability stems from supplier decisions to concentrate on the more common non-driving axles found on standard highway vehicles in great numbers. An August 8, 1974, letter from Rockwell Standard to Docket 74-10 supports the conclusion that the axles can be manufactured, but will not be available until September 1, 1976. Accordingly, the NHTSA has reconsidered the present effective date of September 1, 1975, for full requirements applicable to front steerable drive axles and delays for one year the full requirements for those axle sizes which are not available until September 1, 1976.

Diamond Reo and White also requested reconsideration of the implementation of full requirements for vehicles equipped with a front steerable non-driving axle with a GAWR of 16,000 pounds or more, which are subject to interim dynamometer requirements from March 1, 1975, to September 1, 1975. The manufacturers base their requests for a 1-year delay on difficulties in securing a proven brake assembly capable of handling the higher torque levels. B. F. Goodrich recently dropped development of its heavy air-over-hydraulic disc brake system, to which at least one truck manufacturer, White Trucks, was committed. White states that disc brakes are necessary for heavy front axles and has encountered severe axle-to-axle imbalance problems in its attempts to use other disc brake assemblies at this date. A major axle supplier has notified the NHTSA that the axle itself can be ready by September 1975.

The NHTSA has evaluated the foundation brake assemblies available to this vehicle group and concludes that a year's field testing and experience is necessary and desirable to assure that the new components will perform as designed when placed in highway service. For this reason the full requirements of Standard No. 121 will become effective for vehicles with a front steerable axle of 16,000 pounds GAWR or more on September 1, 1976.

With regard to this vehicle group, International Harvester claimed that the requirement that the brakes be "fully applied" was unfairly introduced into the interim requirements and interferes with braking action. Apparently full pressure applications may cause erratic behavior in some large vehicles with very light bodies, during dry stops in the unloaded condition.

Full application is required to ensure that vehicles provide the lateral tractive capability of an unlocked wheel during panic braking. This interim requirement was proposed in March 1974 as relief from full requirements which have been in effect since February 1971. The NHTSA does not consider it unfair to propose and make final an optional stopping requirement which represents relief from more stringent requirements. More important, the NHTSA considers it crucial to maintain complete directional stability in a panic stop, loaded or unloaded, if the vehicle is unable to meet the stopping distance requirements in that condition. Accordingly, the International Harvester petition is denied.

Diamond Reo also requested that the interim stopping distances for standard highway vehicles be adopted as the full requirements. Their vehicles meet the shorter distances but not by a sufficient margin to absolutely assure them that every one of their vehicles will pass. The fact that the vehicles are capable of stopping well within the shorter distances persuades the NHTSA that this safety level can and should be maintained. Manufacturers are required by the Safety Act to "exercise due care" in certifying that vehicles comply with the applicable standards (15 U.S.C. § 1397(b)(2)). In view of the statutory language, Diamond Reo's request for reconsideration is denied.

In a related matter, the NHTSA has been asked by the *Federal Register* to redesignate the present Table V as Table IIa, which is accomplished in this notice.

Manufacturers raised several matters which were not addressed by Notice 2 and are not, therefore, properly raised as petitions for reconsideration. The NHTSA finds it desirable, however, to respond to them in this notice, in view of the standard's imminent effective date.

Most important was a question by International Harvester in a July 27, 1974, visit by NHTSA engineers to their plant. They indicated that some 121 vehicles may have difficulty in achieving the required burnish temperatures because of the use of the automatic pressure limiting valve that tailors the torque at the front axle. The burnish conditions of Standard No. 121 essentially standardize the preparation of new truck, bus, and trailer brakes for testing under the standard.

In the absence of a specification for these valves, it appears that manufacturers have instituted various practices to assure uniformly good burnishes. It is apparent that different vehicles respond to the burnish procedure with distinctive problems and require solutions tailored to their particular brake packages.

From a regulatory standpoint, however, an optional procedure complicates enforcement of a standard, particularly where a manufacturer has tested one way and the NHTSA tests the other. Test results with the limiting valve, for example, may not be easily comparable with test results in which the valve was bypassed. Both the manufacturer and the NHTSA need a specification that permits flexibility in achieving a uniform burnish in different vehicles, but does not permit two burnish options.

To end this confusion, the NHTSA further specifies the burnish procedure to require that a limiting valve be in use except in the event the temperature of the hottest brake on a rear axle exceeds the temperature of the hottest brake on the front axle by 125° F. In this way the manufacturer and the NHTSA will follow the same test procedure. It should be emphasized that this specification in no way invalidates the testing undertaken to date. Such data can be the basis of certification.

In answer to another International Harvester question, brake adjustments can be made during the burnishing to control brake temperatures. It should be noted that NHTSA is considering a limit on adjustments to three, to be made only during the first 250 snubs. Finally, the NHTSA has indicated to Kelsey-Hayes that it would add "after-stop" to the burnish procedures to describe the specified temperatures more precisely. The NHTSA intends to measure the temperatures within 30 seconds of brake release, but will not reject manufacturer readings taken at any time if they are reasonably related to the temperatures actually generated by the snubs. This latitude is necessary to avoid invalidation of manufacturer testing up to this time.

International Harvester asked that the parking brake requirements of S5.6.2 be modified to require 20 percent grade holding ability "to the limit of traction". The NHTSA has determined that the present grade holding capability is desirable, and it has already provided an alternative requirement in the standard that brakes with a specified static retardation force be provided on all axles. The NHTSA concludes that the option makes a reduction of the grade-holding requirements unnecessary.

Diamond Reo requested that air reservoir volume on trucks and buses be reduced from present requirements. The NHTSA has already reduced the volume from 16 times the combined service brake chamber volumes to 12 times that volume, and concludes that a further reduction is not in the interests of motor vehicle safety. The Diamond Reo request concerning the antilock electrical circuit has already been answered by a letter denial of June 28, 1974.

Wagner Electric requested a minor revision of Figure 1, Trailer Test Rig, which the NHTSA makes in the interests of consistency of terminology. The word "control" is substituted for "pedal".

Finally, the NHTSA has been receiving some indications that manufacturers may arbitrarily specify a higher GAWR than normal simply to avoid requirements of the standard. The NHTSA therefore takes this opportunity to explain the manufacturer's responsibility to specify the GAWR of axle systems on his products.

The NHTSA defines gross axle weight rating as follows:

> "Gross axle weight rating" or "GAWR" means the value specified by the manufacturer as the load-carrying capacity of a single axle system, as measured at the tire-ground interfaces.

Because the GAWR is measured at the tire-ground interfaces, it means that the tires, wheels, brakes, and suspension components are included in the determination. It is obvious that the GAWR of the whole system cannot exceed the rating of any one component, such as tires. Both the NHTSA in its compliance tests and defects investigations, and the Bureau of Motor Carrier Safety on the road, will judge the vehicle on the basis of the values assigned. Therefore it is in the interest of the manufacturer to assign values which accurately reflect the load-bearing ability of the vehicle and its tires and suspension.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective date: March 1, 1975. Because the Standard's effective date for trucks and buses occurs sooner than 180 days and because these amendments create no additional burden, it is found for good cause shown that an earlier effective date than 180 days from the date of publication is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on November 6, 1974.

James B. Gregory
Administrator

39 F.R. 39880
November 12, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 11)

This notice amends Standard No. 121, *Air brake systems*, 49 CFR 571.212, to establish a new test category (and an effective date) for highly specialized tractor-trailer vehicle combinations, and to specify modified brake retardation force requirements for trailers until September 1, 1976.

The National Highway Traffic Safety Administration (NHTSA) proposed these actions, along with other actions that deal with specialized trucks, in a notice published November 14, 1974 (39 F.R. 40168). The NHTSA is acting as soon as possible on the retardation force and integral tractor-trailer issues because they directly affect the manufacture of trailers, which will be subject to the standard's requirements on January 1, 1975. The issue of exemption for oversize and specialized trucks (which have a March 1, 1975, effective date) will be addressed in the near future by a separate notice.

The NHTSA takes note of its recent proposal and request for comments on a postponement of this standard (39 F.R. 43639, December 17, 1974). The NHTSA is proceding with this rulemaking action independently of that proposal to maintain as much continuity as possible in the regulation as presently issued.

The manufacturers and users of auto transporter combination vehicles and the Truck Trailer Manufacturers Association supported the proposal to exempt "integral tractor-trailers" from applicability of the standard until September 1, 1976, because of their particular testing difficulties. It has been suggested that the term "integral tractor-trailer" should be replaced by a more descriptive designation of the combination vehicles in question. The NHTSA agrees and modifies the definition to refer to the transportation of motor vehicles, and to change the defined term to "auto transporters." The comments requested deletion of a requirement in the definition which limited these vehicles to those designed "by a single manufacturer, or person who alters a certified vehicle." The comments expressed concern that the phrase would eliminate the manufacture of tractor and trailer portions separately. Some manufacturers also believed that the reference to "certified vehicles" meant that any incomplete truck tractor equipped with 121-type equipment would have to be certified upon completion by the manufacturer of auto transporters.

The cited requirement does not exclude manufacture by separate individuals of the two portions of the combination, although the preamble inadvertently referred to "trucks and trailers manufactured by a single manufacturer for use in combination." It is possible that one or more persons other than a vehicle manufacturer or alterer may be responsible for the integral design. The NHTSA therefore deletes the phrase in question to permit continued flexibility in the design of these vehicles.

The reference to alteration of a "certified vehicle" confused some businesses which modify stock truck-tractors for use in auto transporters. They believed that a completed vehcile that had been certified to meet Standard No. 121, or an incomplete vehicle with documents referring to Standard No. 121, could not qualify for an exemption as a portion of an auto transporter. In actuality, a complete and certified vehicle, or an incomplete vehicle, can be modified to become a portion of an auto transporter, which would thereby qualify for exemption whatever its previous status.

Bankhead Transportation requested clarification with regard to manufacture of new auto transporter trailers to be fitted to existing truck tractors that are modified to accept the new trailer, These trailers constitute a portion of an auto transporter and as such are exempt until September 1, 1976. The NHTSA has modified the language of S5.3 in one respect from that proposed, to make clear that a transporter trailer manufactured without an equivalent transporter tractor would be tested separately under the requirements of S5.3.2 after September 1, 1976.

The NHTSA also proposed that the retardation force requirements of the standard, which apply to trailers (and, of an optional basis, to a small category of large trucks until September 1, 1967), be somewhat reduced because of the degree of variability being experienced in brake lining performance. The NHTSA requested comments on lower values and on whether such new values should be permanent, or only temporary while further information is developed on variability.

With the exception of General Motors Corporation and Automotive Research Associates, Incorporated (which suggested changes in dynamometer procedures instead of values), the commentors supported the reduction of retardation force values for trailers. General Motors argued that brake force reductions of the trailer should not be undertaken without similar reductions in stopping distance requirements for trucks, and is particular towing vehicles.

The NHTSA, in an amendment published May 17, 1974 (39 F.R. 17750), has already acknowledged the variability of production brake assemblies on trucks and buses by establishing longer stopping distances for an interim period until September 1, 1975. The NHTSA recently denied a petition by Diamond Reo to make these longer distances the permanent values of the standard (39 F.R. 39880). A Paccar Corporation petition presently under consideration on the subject of stopping distances also raises the issue of relaxed stopping requirements. The NHTSA concludes that its decision on that petition will be responsive to the points raised by General Motors.

Several comments on the proposed lower retardation forces included data that further substantiate the determination that variability of brake linings is not sufficiently small to permit 100 percent compilance of every brake assembly at the present values. Wagner Electric Corporation, which originally petitioned for use of the values proposed by the NHTSA, has submitted new data which support a slightly lower minima force level to support the desired mean performance of approximately 60 pounds. Data supplied by Raybestos Manhattan demonstrate a variability to the 3-sigma limit of slightly more than 20 percent calculated by the NHTSA on earlier testing. Molded Materials Company disagreed that compatibility of combination vehciles required 60 percent mean retardation values, but supported the proposed lower minimum force levels as a means to achieve compatibility. Abex Corporation supported the lower values so that actual production experience could be accumulated as a basis for future changes.

The NHTSA concludes on the basis or submitted data that values slightly lower than those proposed will better accommodate the demonstrated variability of brake lining material. Therefore, values of 0.06, 0.13, 0.20, 0.27, 0.34, 0.41, and 0.47 will replace the present values for trailers.

Manufacturers and users of brake lining differed on whether the new values should permanently replace the previous values. The NHTSA did not receive conclusive information indicating that the variability in performance will remain in production units. The NHTSA concludes, therefore, that interim values will permit the accumulation of significant field experience on vehicle compatibility and lining variability, and that a judgment will be made on the basis of that data in the future.

Only Kelsey-Hayes commented on the proposal to apply these new retardation force values to trucks with heavy (or driving) front axles during their interim requirements. As a manufacturer of front axle brake assemblies for this vehicle category, Kelsey-Hayes pointed out that the revision was not supported for truck front axle brake assemblies and would require an unjustified retooling for a period of no more than 18 months. The NHTSA agrees that the data underlying the proposal supports a modification for trailer brake assemblies only. Accordingly the NHTSA does not reduce the optional interim retardation force requirements for trucks specified in S5.1.3.2.

In a separate matter, Rockwell International Corporation asked whether the discussion of 100 percent compliance with Standard No. 121's retardation force requirements was a modification of earlier NHTSA discussion on the "due care" responsibility of each manufacturer to ensure that each of his products meets the requirements of the standard (39 F.R. 17750, May 17, 1974). The requirement to exercise "due care" that each vehicle comply with Standard No. 121 is a statutory requirement (15 U.S.C. 1397), and the above-cited discussion remains the NHTSA position.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571. 121) is amended. . . .

Effective date: January 1, 1975. Because of the imminent effective date of the standard for trailers (January 1, 1975), the National Highway Traffic Safety Administration finds, for good cause shown, that an effective date sooner than 30 days is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51)

Issued on December 31, 1974.

James B. Gregory
Administrator

40 F.R. 1246
January 7, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

(Docket No. 74–10; Notice 12)

Air Brake Systems

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. 571.121, to delete as of September 1, 1976, the emergency brake option that for trucks and buses permits automatic application of the parking brakes in place of a modulated emergency brake system. A notice of proposed rulemaking to be issued shortly proposes modification of the air brake system parking brake requirements and the trailer emergency braking requirements.

Based on a December 1972 petition from the American Trucking Associations (ATA), the NHTSA proposed elimination of the automatic parking brake for use as an emergency braking capability (38 F.R. 14963, June 7, 1973). In response to comments on that proposal which stated that leadtime was insufficient to implement the proposal by September 1, 1974, the NHTSA indicated it would defer final action to a later date and issue any changes with an effective date beyond September 1, 1974 (39 F.R. 804, January 3, 1974). The NHTSA again indicated in May 1974 that "the majority of the changes proposed in response to the ATA petition continue to be viewed favorably." (39 F.R. 17550, May 17, 1974). The NHTSA has now completed its consideration of the modulated braking provision and hereby amends the standard as proposed in June 1973, with an effective date of September 1, 1976, to permit adequate time for engineering necessary changes. It appears, in fact, that the majority of new brake systems are designed to meet generally the modulated emergency brake requirements.

The fundamental change is elimination of the option that permits automatic application of the parking brakes in place of a modulated emergency brake system. The NHTSA agrees with the ATA that a driver should not be forced to use two different methods of applying the emergency brakes, depending on what vehcile he is driving at the time.

In the parikng brake system proposal to be published shortly, it is proposed that the parking brake provisions found as options in the present S5.7 be made mandatory in a revised S5.6 parking brake section. Thus the present S5.7 requirement that a vehicle with a modulated brake capability also have a parking brake capable of manual application at any service reservoir pressure level would be found in the parking brake section. Also the requirement that the parking brake be capable of application in the event of a failure of specific components common to the service brake and emergency braking systems would be moved to the revised parking brake section. Finally the requirement that a parking brake be releasable only if it can be reapplied would be found in the new parking brake provisions.

Several other requirements proposed in June 1973 for the modulated emergency brake system are found in this amendment. The modulated emergency brake must be applied, released, and be capable of modulation, by means of the service brake control. The NHTSA has concluded that the driver is most likely to maintain the best control of his vehicle when he can modulate any braking available to him througd a single control. The emergency system must be capable of two full applications and releases in the event the service brake system fails. This ensures that a disabled vehicle can be safely moved off the roadway.

As proposed in June 1973 and made final in this notice, the emergency brake system of a towing vehicle must operate in the event the trailer air control line or the trailer supply and control lines fail. These requirements ensure that a loaded combination vehicle can stop in specified distances with a failed control line, and that a loaded straight truck (capable of towing) or "bobtail" tractor-trailer is capable of stopping in the event a trailer breaks away. Additionally, the service brake control of a towing vehicle must be capable of modulating the brakes on a towed vehicle following a failure on the towing vehicle. Also, the emergency stopping distance requirement presently in the standard becomes the only permissible test of a truck or bus emergency braking system.

A new test condition has been added to specify when to vent the control and supply lines to atmosphere for test purposes.

As noted above, the majority of these changes appear to be incorporated in large measure in the design of the new brake systems. The NHTSA concludes that truck and bus manufacturers are capable of meeting these modulated brake requirements by September 1, 1976.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571.121) is amended. . . .

Effective date: September 1, 1976.

(Sec. 103, 119 Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407), delegation of authority at 49 C.F.R. 1.51 and 49 C.F.R. 501.8).

Issued on January 10, 1975.

James B. Gregory
Administrator

40 F.R. 2989
January 17, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 14)

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. 571.121, to exempt a small category of oversize and construction vehicles from the applicability of the standard. The exemption criteria were proposed in a January 28, 1975, notice (40 F.R. 4153), which expanded the criteria for this specialized vehicle category in response to comments on an earlier exemption proposal (39 F.R. 40168, November 14, 1974).

In making the proposal, the NHTSA tentatively determined that the specialized configuration of this small category makes compliance with the standard so difficult and expensive that an exemption from the standard would be justified. It was noted that the vehicle function in these cases generally results in restricted operation on the highway (e.g., at low speed, in permit operation, or during daylight hours) and that as a result, vehicle exposure on the highway is limited.

The NHTSA proposed a series of criteria intended to comprehensively identify vehicles with these characteristics. Permanent exemption would be granted to any vehicle that has (1) an overall vehicle width of 108 inches or more, (2) a speed attainable in two miles of not more than 33 mph, (3) a speed attainable in two miles of not more than 45 mph, all-wheel drive, and no cargo- or passenger-carrying capacity, (4) an axle that has a GAWR of 29,000 pounds or more, (5) two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle; or (6) a steerable drive axle driven through gear reduction contained within the wheel.

Three of the numbered criteria ((3), (5), and (6)) were intended to describe the lighter and more maneuverable vehicles whose drive axle configuration or high center of gravity make conformity with the standard expensive and difficult. An example of this vehicle type is the large, carrier-mounted mobile crane. Based on submitted comments, it appears that these criteria should be combined as a single compound criterion in order to avoid inequities in the applicability of the standard. Specifically, either of the criteria numbered (5) or (6) could, of itself, permit heavy or cargo-carrying vehicles on the highway at unlimited speed without 121-type brakes while far smaller vehicles would be subject to the regulation. To accomplish the rearrangement, the exception criteria numbered (3), (5), and (6) are combined in a new category (d) to require for this exception that an expected vehicle have a speed attainable in two miles of not more than 45 mph, no cargo- or passenger-carrying capacity, and either (1) all-wheel drive, (2) a steerable drive axle driven through gear reduction contained within the wheel, or (3) two or more front steerable axles.

It is recognized that total withdrawal of the 16,000-pound tandem steerable axle exemption would make those vehicles with an unlimited highway speed unavailable until the axles are developed or the vehicle speed is reduced to 45 mph. Therefore the NHTSA will make final its proposed 16,000-pound exemption, but only for the interim period until September 1, 1976.

With regard to the 45-mph maximum speed criterion, FMC Corporation suggested that the speed be raised somewhat to ensure that vehicles excepted on this criterion can use the interstate highway system. The NHTSA does not agree that it should encourage use on the interstate system of large, high-center-of-gravity vehicles that are not subject to a minimum braking standard. Accordingly, FMC's request is denied.

Little comment was received on the other criteria. Ford Motor Company suggested a 24,000-pound figure in place of the 29,000-pound proposal. For reasons cited in the January proposal in response to an identical request by Mack this request is denied.

To the degree that this amendment does not grant the requests for exemption raised by Marmon Transmotive in its December 23, 1974, letter to the Administrator, that petition is denied.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. 571.121) is amended. . . .

Effective date: March 1, 1975. Because these amendments relieve a restriction and because of the imminence of the standard's effective date, it is found for good cause shown that an effective date sooner than 30 days from the date of their publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51.)

Issued on February 28, 1975.

James B. Gregory
Administrator

40 F.R. 8953
March 4, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 15)

This notice amends Standard No. 121, *Air brake systems*, 49 C.F.R. § 571.121, in response to petitions for reconsideration of requirements established for trucks and buses, by revision of the retardation force requirements applicable to on/off highway vehicles until September 1, 1975, or September 1, 1976.

The National Highway Traffic Safety Administration (NHTSA) established the final form of Standard No. 121 for purposes of judicial review in November 1974 (39 F.R. 39880, November 21, 1974) (Notice 6). Notice 6 established interim stopping distance requirements for standard highway vehicles, and retardation force requirements for some on/off highway vehicles. Petitions for reconsideration of the decision were received from White Motor Corporation, Mack Trucks, International Harvester, PACCAR Corporation, Diamond Reo, and Breeze Corporations. General Motors effectively requested reconsideration in its response to a separate November notice (39 F.R. 40168, November 14, 1974) (Notice 7) by supporting reduced trailer requirements only with corresponding reduction of truck stopping distance requirements.

General Motors, in its response to Notice 7, indicated that similar 121 vehicles can register as much as a 20-percent difference in stopping distances as a result of uncontrolled variability in brake component performance. International Harvester, which until recently had supported 5-percent longer stopping distances on an interim basis, now points to certain variables, including brake linings, in requesting longer distances on a permanent basis. Diamond Reo reported the same experience in its comments to Notice 2 of Docket No. 74–10. PACCAR requested that S5.3 (stopping distance) be "temporarily repealed" and that longer stoping distances be considered for the future. The NHTSA concludes that PACCAR's request is essentially a petition for rulemaking to increase the stopping distances on a permanent basis.

These positions raise issues which can arise whenever a standard is first implemented: (1) that production variables are so great that inordinate compilance margins are required and (2) that the brake packages necessary to achieve these compliance margins are so aggressive that the handling qualities and durability of affected vehicles are significantly degraded. The NHTSA is, of course, interested in receiving on a continuing basis any new technical information (particularly test data on production vehicles) that bears on these important safety issues. Based on the information submitted to date, however, NHTSA is not prepared to grant the outstanding petitions at this time.

PACCAR also requested that the stopping distance requirements be delayed until the performance of antilock systems and certain test procedures, conditions, and the control trailer test device are specified in areas considered deficient by PACCAR. While these issues might appropriately be considered for future rulemaking, the NHTSA does not agree that change of these important elements of the standard should delay orderly implementation of the standard. Accordingly, the PACCAR request in these areas is denied.

The second area of the standard in which manufacturers seek reconsideration is limited relaxation of requirements for vehicles with front steerable drive axles (S5.3.1.2). Based on unavailability of this axle design, vehicles manufactured before September 1, 1975, with a front steerable drive axle of any size may meet retardation force requirements in place of stopping distance requirements. Because of unavailability of the lighter front driving axles for a greater period, vehicles manufactured before September 1, 1976, with a front steerable drive axle with a gross axle weight rating (GAWR) of less than 18,000 pounds may meet retardation force requirements in place of stopping distance requirements.

Diamond Reo, International Harvester, and Mack Trucks, Inc., now request that the heavier axles also be permitted relaxed requirements until September 1, 1976. White Motor Company in its response to Notice 10 of Docket No. 74–10 requested the relaxed requirements until September 1, 1977. The NHTSA indicated in Notice 6 that this axle type is available and has been offered by Oshkosh Truck Company to the other manufacturers of this vehicle class. While Diamond Reo does not indicate it considered the Oshkosh axle, the other manufacturers indicate that redesign of their limited vehicle output in this area to accept the Oshkosh axle would be unjustified because of cost. Oshkosh, on the other hand, has offered to provide, at cost, technical assistance in the installation of Oshkosh axles to non-Oshkosh pilot test vehicles, and consultation and review of test data obtained from truck-manufacturer-conducted tests.

The NHTSA concludes, based on all information available, that the axle is available at this time and that sufficient leadtime has been made available for the location and testing of an axle of this type. The manufacturers who request further delay do not claim that the installation is technologically unfeasible or otherwise impracticable. Although they cite adverse economic consequence for the limited numbers of vehicles they produce in this category, this argument does not consider the major economic consequences for the Oshkosh Company, who state that 72 percent of their vehicle production would be adversely affected by any further delay. The petitions of White, International Harvester, Diamond Reo, and Mack are accordingly denied.

Due to unavailability until September 1, 1976, front steerable non-driving axles with a GAWR in excess of 16,000 pounds are permitted the same relaxed requirements as the driving axles just discussed. White Motor Corporation, in its comments to Notice 10 of Docket No. 74–10, requested the relaxed requirements be extended to September 1, 1977, because of the long leadtime associated with manufacture of these vehicles. The NHTSA will monitor the availability of these axles to ensure their readiness for September 1, 1976, and will consider a later effective date for them if they are not available as presently scheduled. At this time, however, it appears that the axles will be ready sufficiently in advance of September 1, 1976, to permit satisfaction of the full requirements on that date. Accordingly White's petition is denied.

As earlier noted, both the vehicles equipped with certain driving or non-driivng front steerable axles are permitted to meet retardation force requirements in place of distance requirements for an interim period. A reduction of these retardation force requirements was the subject of a proposal in Notice 7, which was acted on for trailers in Notice 11 (40 F.R. 1246, January 7, 1975). It was concluded that no argument had been made for a temporary reduction of retardation forces on the front axle of heavy trucks, most of which are integral trucks which experience high levels of dynamic load shift during braking. Comments by PACCAR to Notice 6, however, emphasized that retardation force requirements at the rear axle could be reduced because the load shift off the rear axle effectively results in over-torque of that axle.

The NHTSA's intent in substituting retardation force requirements for stopping distance is to ensure the best braking that is presently available, and it appears that rear brake retardation requirements may, in some cases, inhibit the tailoring of brake systems on different vehciles to achieve this goal. The most satisfactory means to reduce rear axle requirements while maintaining front axle requirements is to eliminate requirements for the vehicle as a whole, to permit the manufacturer latitude in selecting retardation force requireemnts at the rear axle. The present requirements for front axle retardation forces remain in the standard, and by this notice, the NHTSA deletes the requirement for retardation force values for the vehicle as a whole.

PACCAR requested complete withdrawal of the retardation force requirements, as well as the brake power and fade requirements as they affect all trucks. The NHTSA, of course, considers these characteristics of a brake system fundamental, and does not agree that the requirements are impracticable or should be withdrawn. PACCAR's request is therefore denied.

With regard to the vehicles that may meet retardation force requirements in place of stopping distances, International Harvester requested confirmation that S6.3.1.2 is an option that the manufacturer may choose to ignore in the loaded or unloaded condition if the vehcile in question meets the stopping distance requirements in that condition. This agency stated in the preamble to Notice 6 that "the NHTSA considers it crucial panic stop, loaded or unloaded, if the vehicle is to maintain complete directional stability in a unable to meet the stopping distance requirements in that condition." International Harvester's understanding of this language is correct.

PACCAR requested deletion of brake actuation requirements as redundant in view of stopping distance requirements. The NHTSA has considered elimination of the requirements previously, and concluded at that time that the requirement should be maintained (37 F.R. 3905, February 24, 1972). At this time the actuation requirements ensure fast braking on the vehicles under S5.3.1.2 which need not meet stopping distance requirements. The NHTSA will consider this PACCAR request for future rulemaking but does not act on the petition for amendment at this time.

Finally, PACCAR requested specification of antilock performance characteristics. The standard does not require antilock systems, and the NHTSA has concluded that specification for manufacturers who utilize these devices would be design restrictive, without a corresponding safety benefit. No manufacturer other than PACCAR indicates that a safety need exists to specify the cycling of antilocks, and the NHTSA is unable to determine from the PACCAR petition what evidence exists that antilock specification would improve vehicle handilng. PACCAR's petition is accordingly denied.

In areas unrelated to the petitions for reconsideration, the NHTSA corrects an error in S6.1.8.1 and adds a clarifying word to S5.7.1.2, without in any way changing the requirements of those paragraphs.

In consideration of the foregoing, Standard No. 121 (49 C.F.R. § 571.121) is amended. . . .

Effective date: March 21, 1975. Because of Standard No. 121's March 1, 1975, effective date and because this order relieves a restriction, it is found for good cause shown that an effective date sooner than 30 days from the date of publication of that order is in the public interest.

(Sec. 103, 119, 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 C.F.R. 1.51).

Issued on March 14, 1975.

James B. Gregory
Administrator

40 F.R. 12797
March 21, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 16)

This notice responds to three petitions for reconsideration of the National Highway Traffic Safety Administration's December 31, 1974, decision to implement Standard No. 121, *Air brake systems*, as scheduled on January 1, 1975, for trailers and on March 1, 1975, for trucks and buses. The petition of American Fire Apparatus Company for reconsideration of the September 1, 1975, effective date for fire fighting apparatus is granted for a period of six months. The petitions of the Milk Industry Foundation and of Representative James H. Quillen for delay of the standard as a whole are denied. The petition of White Motor Corporation has already been responded to by Notice 15 of Docket No. 74–10 (40 F.R. 12797, March 21, 1975).

The Milk Industry Foundation (the Foundation) requested delay of the standard as it applies to trucks and buses until March 1, 1976, to permit further testing of the new braking systems (and redesign as necessary) and to conduct an analysis of the economic impact of the standard. The Foundation believes that insufficient time has been allowed for vehicle testing.

The NHTSA has evaluated the readiness of manufacturers to meet the standard throughout the four years since issuance. The original January 1, 1973, effective date was delayed until September 1, 1974. In early 1974, the vehicle and component test programs involved in implementation were again evaluated, and the NHTSA proposed delay of the effective date to January 1, 1975 (39 F.R. 7966, March 1, 1974) (39 F.R. 17563, May 17, 1974). Based on submitted comments, it was determined that a March 1, 1975, effective date for trucks and buses, and a January 1, 1975, date for trailers would permit adequate time to complete preparations for the standard's implementation (39 F.R. 17750, May 17, 1974) (39 F.R. 20380, June 10, 1974). These delays were undertaken although one manufacturer expressed readiness to meet the September 1974 date, and International Harvester, the largest manufacturer of air-braked vehicles, expressed readiness to meet the January 1, 1975, effective date. This decision was reevaluated in November 1974 and found to remain valid, although a few larger vehicle types were permitted a later date (39 F.R. 39880, November 12, 1974).

The Foundation also requested that the standard be delayed until its economic impact is evaluated. The NHTSA conducted an evaluation of economic impact shortly before implementation of the standard (39 F.R. 43639, December 17, 1974) and, based on several hundred comments, concluded that the standard should be implemented (40 F.R. 1248, January 7, 1975). The NHTSA disagrees with the Foundation that the evaluation should have been conducted in accordance with Executive Order 11821 (on inflation impact studies) when the final criteria and procedures for implementation of the Order were not yet established. The NHTSA has committed itself to continue monitoring the effectiveness of its standard in accordance with its statutory mandate, with a view to identifying any modifications that would lower costs while achieving comparable levels of safety.

As indicated by the submissions of the Milk Industry Foundation, there has evidently been much confusion among user groups such as the dairy industry over the effect of the braking standards on their operations. In order to meet the requirements that a vehicle stop in a specified distance when tested by the government, chassis manufacturers have in some cases specified center of gravity heights for conformity purposes that are lower than the loaded center of gravity of trucks that these operators are accustomed to using. The body builders who complete and certify the trucks have passed these center of gravity specifications on to the user groups. This has given rise to fears on the part of the dairy industry and others that they must reduce the loads carried on their trucks.

Actually, this is neither the legal effect nor the intended policy effect of the standard. The standard does not regulate the manner in which trucks are loaded or used on the road, and users are free to use their own judgment in loading their trucks, as they have been in the past. The standard is designed so that a properly-designed vehicle which satisfies its performance requirements under the conditions stipulated for compliance testing will perform safely under all reasonable conditions or real world use. Trucks equipped with the stronger and better-modulated brakes required by the standard, when loaded similarly to those in the past, should in fact be much safer both for their occupants and for the rest of the driving public than comparable vehicles were before. If the NHTSA should discover vehicles being produced that do not perform safely when loaded in a normal manner and can establish that this condition is attributable to deficiencies in vehicle manufacture or design, it can proceed against their manufacturers under its safety-related defect jurisdiction.

Representative Quillen requested consideration of a significant postponement of the standard, believing that a delay would increase truck sales. An examination of the truck market indicates that several months' inventory of trucks manufactured without the new systems remained unsold on March 1, 1975, suggesting that the economic downturn, rather than the new systems, accounts for many lost sales. The American Trucking Associations statistics on general freight tonnage indicate a steady decline in highway tonnage from the high figure reached in November 1973. It does appear that some of the slowdown is attributable to "pre-buying" of trucks to avoid Standard No. 121, but this effect would occur whatever the date of implementation. Accordingly the petitions of the Milk Industry Foundation and Representative Quillen are denied.

American Fire Apparatus Company has requested that the NHTSA reconsider its decision to implement the standard as scheduled, so far as it applies to fire fighting vehicles. NHTSA policy has been to grant fire fighting vehicles a minimum of two years from the issuance of any standard to achieve compliance because of the unique leadtime problems associated with the industry. (49 CFR § 571.8). On this basis, the NHTSA granted a delay of the effective date from September 1, 1974, to September 1, 1975, for these vehicles at the request of American Fire Apparatus (39 F.R. 17750, May 17, 1974). At the same time the general implementation date was extended six months. The NHTSA agrees that fire fighting apparatus is entitled to a full year's delay because of its long leadtime problems.

By this notice, the NHTSA denies all outstanding petitions for reconsideration of Standard No. 121's effective dates, with the exception of the date for fire fighting vehicles.

In consideration of the foregoing, Standard No. 121 (49 CFR § 571.121) is amended. . . .

Effective date: June 16, 1975. Because the previously established effective date for fire fighting apparatus was less than 180 days after the date of publication of this amendment in the *Federal Register*, it is found for good cause shown that an effective date less than 180 days from the date of publication is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51).

Issued on May 12, 1975.

James B. Gregory
Administrator

40 F.R. 21031
May 15, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 74–10; Notice 17)

This notice responds to six petitions for reconsideration of a recent amendment of Standard No. 121, *Air Brake Systems*, 49 CFR 571.121. That amendment deleted as of September 1, 1976, the emergency brake option that permits automatic application of parking brakes in place of a modulated emergency brake system on trucks and buses (40 FR 2989, January 17, 1975). In addition, that notice standardized the operation of the emergency brake control, specified a minimum number of emergency brake applications and releases, and provided for the integrity of the towing vehicle braking system in the event of failure of the air lines to the towed vehicle. On the basis of information and arguments presented by several petitioners, the National Highway Traffic Safety Administration (NHTSA) hereby withdraws the amendment that specified a minimum number of emergency brake applications and releases.

None of the petitions for reconsideration objected to the NHTSA's deletion of automatic parking brake application as a means of providing emergency braking capability. There were no objections to the specification that the emergency brake system control be the same control as that for the service brake system. These provisions remain unchanged, and will become effective September 1, 1976.

The standard tests the emergency braking capability of a vehicle by introducing a "single failure in the service brake system." Bendix Corporation requested that this requirement be replaced by a requirement for emergency braking capability "with either circuit's reservoir at zero psi." Presumably Bendix is suggesting that the "split system" design found on today's air-braked trucks be tested by draining either side of the system. Standard No. 121 does not specify a particular type of emergency brake system and cannot therefore specify failing any particular component. The NHTSA believes a vehicle should be capable of making stable in-line stops within the specified distance with a failure in any hose or reservoir in the service brake system. For instance, a failure in the air hose to the right front wheel should not make it impossible for a driver to keep the vehicle within a 12 foot wide lane. The agency does intend to clarify the status of various air lines in powered vehicles, particularly towing vehicles, to answer questions raised by International Harvester and the State of California concerning service brake system failure. These clarifications will appear in an upcoming notice on parking brake systems.

International Harvester, Ford, Midland-Ross, and Bendix objected to the requirement of S5.7.3 that requires the emergency brake system to be capable of not less than two applications and releases, as determined by brake chamber air pressure of 60 psi or more during the pressure phase of operation, and brake chamber air pressure of not more than 1 psi during the pressure release phase of operations. The manufacturers (and the American Trucking Associations) were concerned that the specification of 1- to 60-psi values was design-restrictive and would force substantial redesign of vehicles before the existing new designs can be thoroughly tested. Some of the petitions questioned whether the test would be conducted statically or dynamically.

The NHTSA is concerned that manufacturers not be unduly burdened with modifications to their systems during the initial introduction period of the standard. The agency has regularly indicated in its correspondence that it is monitoring implementation of the standard to minimize disruption and costs while maintaining the standard's safety benefits. The maximum and minimum pressure values in question were specified simply as objective testing criteria and are not intended as design restrictions that fulfill a safety function.

In view of the redesign problems noted and their accompanying disruption, the NHTSA withdraws the application-and-release specification and will not reestablish it without further notice and opportunity to comment. (In answer to Bendix's question, it is noted that the 60 psi value in the pressure release phase was not intended to replace the "zero-torque" criterion for release of spring brakes.)

Midland-Ross, International Harvester, and Ford expressed several objections to the three requirements of S5.7.4 and the related test conditions of S6.1.14. The requirements are intended to assure that a combination vehicle remains capable of emergency braking performance in the event of hose failure between the towed and towing vehicles, including failure of both hoses due to trailer breakaway.

Comments incorrectly assumed that the requirements specify modulation of the trailer braking system in the event of hose failure under S5.7.4(b) and (c). In fact, section S5.7.4 does not require trailer braking requirements, but only specifies that a towing vehicle meet the enumerated requirements under certain conditions.

To eliminate confusion about the role of trailers in these tests, sections S5.7.4(a) and (b) are hereby revised to make it clearer that the vented line(s) to the trailer are only test conditions under which the towing vehicle must demonstrate emergency braking stopping distance capability. To eliminate a separate source of confusion in section S5.7.4(a), which is intended to simulate trailer breakaway, the section is also revised to eliminate an incorrect requirement for testing with a failed control line and an intact trailer supply line.

Midland-Ross and International Harvester objected to the test conditions of S6.1.14, which underlie S5.7.4(a) and (b). The S6.1.1.4 procedure is intended to simulate a trailer breakaway or, in the alternative, a failed control line on a loaded combination vehicle. International Harvester expressed the belief that five new tests were thereby added to the standard. It is now made clear that only one additional test of a single-unit vehicle capable of towing is required, and two additional tests of a truck tractor are required. These tests are conducted in the test sequence at steps 4(e) (loaded) and 6(e) (unloaded).

International Harvester questioned as unrealistic the criterion in S6.1.14 that specifies a 1-minute delay in braking following rupture of a brake line. The NHTSA recognizes that the towing vehicle protection system is expected to act in much less than 1-minute to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle. The 1-minute interval is intended only to permit adverse "testing-to-failure" of an inadequately designed system. As a practical matter, the NHTSA will test when air pressure is lowest during the 1-minute period.

Midland-Ross implied in its comments on S6.1.14 that the S5.7.4(a) test would be conducted with a trailer attached whose emergency brake system is activated during testing. As noted earlier, S5.7.4 applies only to a towing vehicle and only its brakes are tested. In S5.7.4(a), no trailer is attached to the towing vehicle (simulating a breakaway). In S5.7.4(b), a trailer is attached (simulating a failure), but only tractor brake activation is permissible.

Midland-Ross expressed the belief that S5.7.4(c) requires modulation of the trailer brakes in the event of a failed air control or supply line. In fact, the section only requires that a towing vehicle be capable of modulating the air in the supply or control line following a single failure in the service brake system on the towing vehicle, but does not require modulation of the towed vehicle emergency brake system under any circumstances (including control line failure). The requirement ensures that a single failure in the truck itself will not prevent modulation of an unimpaired system from the towing vehicle protection system rearwards. A clarification has been added to limit the single failure to the service brake system of the towing vehicle, not including either of the air lines to the towed vehicle.

Because several modifications are being made to the requirements of S5.7 as previously published, the NHTSA is republishing the entire provisions of S5.7 as they will become effective September 1, 1976, although paragraphs S5.7, S5.7.1, S5.7.2, and S6.1.14 remain unchanged.

In consideration of the foregoing, S5.7 of Standard No. 121 (49 CFR § 571.121) is amended, effective September 1, 1976. . . .

Effective date: September 1, 1976.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at CFR 1.51.)

Issued on July 23, 1975.

James B. Gregory
Administrator

40 F.R. 31771
July 29, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 2)

This notice amends Standard No. 121, *Air Brake Systems*, 49 CFR 571.121, to establish new service brake system stopping distances until January 1, 1978, and increase brake actuation and release times on trucks, buses, and trailers. This notice also excludes from the standard trailers with an unloaded vehicle weight that is not less than 95 percent of the gross vehicle weight rating (GVWR), and any other vehicle with an unloaded vehicle weight that is not less than 95 percent of the GVWR and which has a maximum speed of 45 mph.

The NHTSA proposed reduction of Standard No. 121's stopping distance requirements (40 FR 24915, June 11, 1975), because data submitted by manufacturers of air-braked vehicles and air brake components indicated that variability of performance of certain braking and related components could in some vehicles necessitate more aggressive brake packages than are desirable to achieve the stopping distances contemplated in development of the standard. The agency also proposed increases in permissible brake actuation times to promote optimum cycling of the antilock systems used by most manufacturers in meeting the stopping distances. At the same time, the agency denied the petitions of the American Trucking Associations (ATA) and Consolidated Freightways (Consolidated) for extension of the required stopping distances as necessary to eliminate the necessity of high-torque brakes and antilock systems, and for suspension in whole or part of the standard's requirements. The denials were based on NHTSA's view that increased directional stability is critical to improvement of brake system performance on heavy vehicles, particularly articulated vehicles, that share the highway with passenger cars and other light vehicles.

Vehicle manufacturers and component suppliers supported without exception the increase in stopping distances. Additional discussions and data submitted by some manufacturers indicate that substantial effort is being made to identify and control all of the variables which affect compliance of air-braked vehicles with Standard No. 121. Most manufacturers recommended that the proposed extended distances be made permanent, but the NHTSA concludes that insufficient data exist at this time on which to base such a decision. Accordingly, the stopping distances are modified as proposed for a period that ends January 1, 1978. The NHTSA does not, therefore, accept the recommendations of Freightliner and Mack for longer distances, or the Freightliner recommendation for testing at 55 mph.

The proposed language has been modified to specify correctly the NHTSA's intent to extend service brake stopping distances on a skid number 75 surface for all vehicles under S5.3.1.2 and S5.3.1.3. Also, the additional sentence proposed for S5.3.1.3 was essentially redundant in view of the modifications to Table IIa, and that sentence has been deleted.

Manufacturers also supported the proposed increase in permissible brake actuation timing from 0.35 to 0.40 seconds for trucks and buses, from 0.25 to 0.35 seconds for trailer converter dollies, and from 0.25 to 0.30 seconds for trailers other than trailer converter dollies. The ATA recommended establishment of a minimum as well as maximum limit. While this suggestion may have merit, the NHTSA does not have sufficient time at this point to fully consider the suggestion, and will therefore treat it as a petition for rulemaking.

Bendix suggested that the increased actuation be permitted only for an interim period, but the NHTSA has evidence of degraded performance generated by the present timing which justifies a permanent change. Bendix is requested to submit any data for consideration that support its view that superior systems will exist by January 1, 1978, that provide both a faster and smoother response.

Freightliner Corporation repeated its view that actuation and release times are design-restrictive without corresponding safety benefit. While the NHTSA is willing to consider Freightliner's view for future action, it is noted that the ATA suggestion of minimum and maximum limits conflicts directly with Freightliner's point of view. In any case, elimination of these requirements was not contemplated by the scope of the proposal and will not be undertaken at this time.

Several manufacturers indicated that the petitions for longer actuation time implied the need for an increase in brake release times as well. White Motor Corporation supplied data substantiating the view that optimization of increased brake actuation times depends in part on design freedom to increase the release time in the necessary valving. Although increased release times were not proposed by the June notice, an increase in release times comparable to actuation times was contemplated by the intent of the modifications to permit somewhat slower valve action. To accomplish the intended revision, the NHTSA concludes that it is in the public interest to modify both the actuation and release time of S5.3.3 and S5.3.4 by an increase in permissible timing of 0.05 seconds. Fruehauf's suggested increase in trailer timing to 0.35 will be further considered, but the NHTSA does not believe it necessary to act on this level of increase without benefit of comments by interested persons.

The ATA, Consolidated, the Milk Industry Foundation, and Hackney Brothers submitted arguments that the stopping distance and brake timing modifications were insufficient to solve fundamental cost and reliability problems attributed by them to Standard No. 121. The ATA cited recall campaigns of antilock systems as evidence that the presence of high-torque front brakes on some trucks creates safety problems in the event of antilock malfunction. The ATA also asserted that "no lockup" performance on trailers contributes insignificantly to highway safety, and asked that antilock, if mandated, be required only on a vehicle's drive axles.

Consolidated relied on a manufacturer's statements of vehicle instability with the 121 brake systems as a ground for suspension of the standard. The company also cited cost estimates for the standard, and requested that they be substantially reduced by dropping the "no lockup" requirement entirely, or requiring it only on the vehicle's drive axles, and by extending stopping distances to eliminate the requirement for front axle 121-type brakes.

The NHTSA has undertaken an extensive evaluation of the standard's effect on truck braking characteristics. One element of that evaluation is testing by the NHTSA's Safety Research Laboratory of pre-121 and 121-equipped truck tractors. One series of tests (on a dry surface with a skid number somewhat higher than 75) included a stop from 60.8 mph in 231.2 feet by a 121-equipped International Harvester tractor (with front axle antilock disconnected and a full brake application) and a 121-equipped trailer in which the front wheel brakes never locked up. This experience indicates that 121-type front brake package need not be so aggressive as to create a safety hazard in the event of an antilock malfunction which escapes the notice of the driver.

The NHTSA's monitoring of the standard's implementation also supports NHTSA's position that the malfunctions experienced in initial antilock production and installation are an inevitable consequence of the introduction of a new system in high production. Those malfunctions that have been determined to be safety-related and that could result in unsafe highway operation have been recalled for remedy by the manufacturers concerned.

The NHTSA has evaluated Consolidated's revised cost objections to the standard. The information submitted does not modify the NHTSA's earlier conclusions. Accordingly, the NHTSA reaffirms its decisions not to revise or revoke the standard as requested by the ATA, Consolidated, the Milk Industry Foundation, or Hackney Brothers.

Consolidated characterized its comments as both a petition for reconsideration and, in the alternative, as a petition to modify the standard. A petition for reconsideration may under 49 CFR 553.35 be submitted in response to a "rule" issued by the agency, but the denial of a petition is not itself a "rule" within the meaning of that section. Therefore Consolidated's "petition for reconsideration" is invalid. Considered in the alternative as a petition for rulemaking to modify the standard, the NHTSA denies the petition for the reasons noted.

Other comments to the docket requested changes to the standard which the NHTSA will consider further but cannot dispose of at this time. The revisions in this notice must be issued prior to September 1, 1975, so that manufacturers are not required to meet the 245-foot stopping distance which becomes effective September 1, 1975. The issues, in addition to others noted earlier, that will be further considered are: (1) Freightliner's request for deletion of the dynamometer requirements for the front axle; (2) PACCAR's request for modification of dynamometer requirements on the drive axles; and (3) several manufacturers' requests for a decreased grade in the parking brake requirement. The NHTSA does not agree with Freightliner that the test surface and control trailer specifications are insufficiently objective, or that the wet surface and emergency brake stopping distances need to be increased. Testing by the NHTSA Safety Research Laboratory does not indicate a need to increase these distances. The agency will, of course, continue to evaluate any new data that indicate more objective specifications can be reasonably implemented, or that longer distances are advisable.

The third proposal for modification of the standard was revision of the standard's applicability to exclude trailers with a GVWR of 10,000 pounds or less, trailers with an unloaded vehicle weight that is not less than 95 percent of its GVWR, and any other vehicle that has a maximum speed of 45 mph, an unloaded vehicle weight that is not less than 95 percent of its GVWR, and no passenger-carrying capacity.

No comments opposed the exclusion of trailers whose unloaded vehicle weight is not less than 95 percent of the GVWR, and the standard is accordingly amended to exclude this vehicle group.

The State of California objected to exclusion of light trailers (GVWR of 10,000 pounds or less) on several grounds. Their comments point out that a light trailer built for low density loads can be dangerously overloaded. The State also cited that ease with which higher GVWR trailers could be derated in order to take advantage of the exclusion for lighter vehicles. California also noted the increased complexity of enforcement of the standard with added exclusions of this type. Altec Industries, which petitioned for the exclusion, argued that the exclusion should be broadened to 15,000 pounds GVWR. On balance, the NHTSA agrees with California that the exclusion might create more safety problems than safety benefit. In view of this conclusion, the agency has decided not to revise the standard's applicability in this respect.

The NHTSA also proposed exclusion of vehicles with the following characteristics: a speed attainable in 2 miles of not more than 45 mph, an unloaded vehicle weight that is not less than 95 percent of the vehicle GVWR, and no passenger-carrying capacity. Manufacturers of those vehicles generally supported the proposal but expressed confusion over each of the criteria. The largest question arose over the meaning of what constitutes the "unloaded vehicle weight." Crane Carrier, FMC Corporation, The Heavy Specialized Carriers Conference (HSCC), and Koehring pointed to the significant difference between the GVWR and the actual traveling weight of crane carrier models, considering special equipment which may or may not be included with the vehicle as optional or be permitted on the vehicle in transit.

The NHTSA has expressed the unloaded vehicle weight criterion in terms defined in § 571.3 of its regulations (49 CFR § 571.3) in a way which avoids these problems raised by the manufacturers. As defined, "unloaded vehicle weight" will normally be the GVWR of a vehicle minus its rated cargo load and its assigned occupant weight (at least 150 pounds). The rated cargo load would not include the weight of portions of a vehicle which are essential to its specialized function whether or not they are removed in accordance with State regulation for transit purposes. To arrive at "unloaded vehicle weight," a manufacturer must only refer to the GVWR he has assigned to his vehicle, and subtract from it the rated cargo load he has assigned plus 150 pounds of each occupant position. These calculations are totally separate from the presence of particular optional equipment or necessary components which may or may not be removed for highway travel.

Manufacturers and the HSCC also asked whether occupant positions for crew members such as flagman or crane operator could be provided without constituting "passenger-carrying capacity." The NHTSA uses the word passenger in this context to mean a person who does not help to operate the vehicle or its equipment, *i.e.*, who is not part of an operating crew. Positions for the crew necessary to operate a vehicle's specialized equipment would not disqualify a vehicle under the passenger-carrying criterion.

Manufacturers recommended that the speed limitation of 45 mph be raised to 50 mph to allow unrestricted travel on all highway systems. The NHTSA remains convinced that this equipment with a high center of gravity and limited braking poses a safety problem when traveling at near highway speed in the flow of traffic. With the national speed limit at 55 mph, it is considered prudent to limit the speed of air-braked vehicles without 121 brake systems to a maximum attainable speed of 45 mph. For the benefit of the HSCC, it is noted that the definition of maximum attainable speed specifies a level surface for the basis of speed determination.

With regard to these vehicles, American-Coleman Company has requested that all vehicles equipped with a front steerable drive axle of 8,000 pounds GVWR or more be excluded from the requirements of Standard No. 121. The NHTSA has already fully considered this request, and in a series of notices (30 FR 40168, November 14, 1974; 40 FR 4153, January 28, 1975; 40 FR 8953, March 4, 1975), explained its reasons for not proposing such an exclusion. American-Coleman's petition is repetitious of its earlier petition and contains no new data for consideration. Accordingly, it is denied.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective date: August 27, 1975. Because these amendments do not impose additional requirements on any person and because they must replace provisions effective September 1, 1975, it is found for good cause shown to be in the public interest that they become effective sooner than 30 days following publication in the *Federal Register.*

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on August 15, 1975.

Robert L. Carter
Acting Administrator

40 F.R. 38160
August 27, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–7; Notice 3)

This notice amends Standard No. 121, *Air Brake Systems*, 49 CFR 571.121, to permit bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvests to meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

This amendment follows reevaluation of a petition filed by Utility Trailer Manufacturing Company, in light of further data submitted by the company on August 6, 1975, and September 23, 1975 (these materials appear in NHTSA Docket No. 75–5). The NHTSA proposed to exclude certain specialized agricultural trailers from the emergency and parking brake requirements because "spring" brakes utilized for these systems were creating particular difficulty in harvest operations (40 FR 13316, March 26, 1975). Comments persuaded the agency not to proceed with the proposal at that time for two reasons (40 FR 28097, July 3, 1975). It appeared that control of air leakage and the installation of a manual parking brake control would permit disengagement in most cases, and that manual release and application would serve in the instances when all air had leaked away. The second reason to withdraw the proposal was that the excluded category was not defined well enough to limit the extent of the exclusion.

Utility has since supplied information indicating that air leakage cannot be controlled sufficiently to rely on it for the release of spring parking brakes under the specialized conditions of harvest operations. More significantly, Utility reports that inexperienced persons who mechanically release the spring brakes often fail to reengage them for highway operation, permitting the trailer to operate on the highway without a secondary means of braking.

With regard to the agency's concern that manufacturers supplying spring brakes to meet the standard would be placed at a competitive disadvantage by the exclusion, utility indicates that the manufacturers of the specialized trailers in question would approve of a parking and emergency braking system other than spring brakes. The competitive disadvantage would actually have occurred only with those highway trailers that were unintentionally included in the overly broad proposed definition.

With the newly submitted information in mind, the NHTSA has decided to issue the proposed exclusion, but in a more limited form than proposed. To limit the effect of this amendment to those trailers for which it is intended, the proposed definition is modified to describe more precisely trailers that are actually disconnected from highway truck-tractors and drawn through the fields as part of their function.

As discussed in the preamble to the proposal, the exclusion would have entirely excluded the trailers from the standard's emergency and parking brake requirements, relying on Bureau of Motor Carrier Safety Regulations to ensure the use of a "breakaway" system in their place. It is now apparent, however, that many of the vehicles in question would operate intrastate only, and that the breadth of the proposal must be somewhat restricted, to exclude only vehicles that are fitted with a breakaway system that complies with BMCS requirements.

In order to permit manufacturers of these specialized vehicles to commence manufacture for the 1976 harvest season, the NHTSA has decided to extend the duration of the limited exclusion from the proposed date of January 1, 1976, to March 1, 1976. Utility requested that the date be extended to June 30, 1976, and the NHTSA will issue a further proposal if any further delay of this magnitude appears justified.

In consideration of the foregoing, S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) are amended. . . .

Effective date: December 5, 1975. Because this amendment does not place additional requirements on any person, and because manufacturers must be informed of future requirements for their products, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on November 28, 1975.

James B. Gregory
Administrator

40 F.R. 56898
December 5, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 6)

This notice amends Standard No. 121, *Air Brake Systems*, to suspend until January 1, 1977, the service brake stopping distance requirements as they apply to buses.

The NHTSA proposed a 1-year suspension of service brake stopping distances (40 FR 52856, November 13, 1975) following a public meeting on Standard No. 121 (49 CFR 571.121). Bus performance was reviewed by manufacturers and users, and by Rockwell International Corporation, presently the manufacturer of most of the axles and antilock components installed in transit and intercity buses. Other data collected by the NHTSA substantiate a pattern of erratic behavior in bus antilock equipment used in most transit and intercity operation that warrants disconnection while a correction is fully developed. The proposed suspension was based on manufacturer and user requests for a period in which modified hardware could be field-evaluated along with other antilock systems being offered for bus applications.

The comments uniformly supported the proposed suspension of service brake stopping distance requirements (including the "no lockup" requirement) for transit and intercity buses. However, component suppliers, bus manufacturers, and bus users differed over the extent of the proposal in three areas.

Rockwell and General Motors expressed concern that the preamble to the proposal had not made clear whether the proposal was intended to meet problems other than erratic antilock performance. Transport of New Jersey also objected that the proposal might be narrowly construed to mean that only the "no lockup" aspect of the stopping distance requirements would be suspended. AM General questioned whether the revision included "any attempt to impose stopping distance and lane limit test requirements."

The NHTSA proposed suspension of the service brake stopping distance requirements (S5.3.1) in their entirety, not just the "no lockup" requirements of the section. Suspension of the entire requirement was intended to moderate the maintenance and misadjustment problems that are associated with the faster wearing brake linings provided in compliance with the standard.

General Motors noted that, because of the unique configuration of the braking system on its new transit bus, the limited nature of the NHTSA's proposed suspension, specifically the continuation of the partial system failure requirements, inadvertently prevents their bus from utilizing the lower-coefficient linings intended by the proposal. This issue is presently under consideration by the agency, and may be the subject of another proposal to be issued shortly.

The second area of concern to some manufacturers was whether the NHTSA intended to cover school buses with the proposed exclusion. General Motors and Wagner Electric Corporation expressed the view that school buses should not be included. International Harvester, Crown Coach, and several school districts believed that the vehicles should be included in the suspension. The NHTSA intended to include school buses in its proposal and, based on review of the comments, has concluded that these buses should be included in the suspension.

International Harvester pointed out that the stop-and-go cycle of school buses can cause distinctive stresses on the air brake system that are similar to that encountered in transit bus operation. While not made explicit, Crown Coach's comments illustrate that some school buses utilize the same axles and antilock component as transit and intercity buses. Limiting the suspension to a portion of the air-braked school buses would create an unintended economic disadvantage for some school buses of this type.

Wagner and General Motors argued that some school buses utilize truck chassis and brake systems, and that these systems do not suffer from the same problems as the bus components criticized at the public meeting. It is true that the components utilized generally in trucks and also used in some buses have been determined to be reliable (40 FR 59222, December 22, 1975). The usage cycles of various vehicles are, however, evidently an important factor in some of the problems that have been experienced. Considering the similarity in the usage of school buses to that of transit buses, this agency has decided that the most desirable course of action is to include school buses in the suspension of stopping distance requirements.

The third area in which commenters questioned the extent of the proposal was the length of the suspension. Bus operators and their associations (*e.g.*, National Association of Motor Bus Owners (NAMBO), American Public Transit Association (APTA), Chicago Transit Authority) and bus manufacturers (General Motors, AM General, and Eagle International) generally argued that a 1-year evaluation period following development of adequate corrections to existing or new hardware would be necessary. Motor Coach Industries and Transportation Manufacturing Corporation (manufacturers of the majority of intercity buses) supported the 1-year proposal without commenting on the adequacy of the proposed 1-year suspension period. Rockwell, as the present manufacturer of most of the transit and intercity bus axles and antilock systems, cautioned the NHTSA that a specific date for the effectiveness of S5.3.1 would reduce the thoroughness of the evaluation program. The company did support the 1-year suspension.

The proposal was for a 1-year suspension only. This agency has not found this to be an emergency situation that would justify promulgating a delay greater than that proposed without the benefit of notice and opportunity to comment. Therefore, the NHTSA hereby makes final its proposed 1-year suspension of the stopping distance requirements, and will further evaluate the requests for a longer period of suspension. Bus manufacturers have stated that they intend to initiate field evaluation of improved antilock systems, and this agency will actively monitor these efforts as the basis for future action. The support of field testing by NAMBO and APTA will also be important in making meaningful evaluations of anticipated system modifications.

Chrysler, Freightliner, and International Harvester recommendations on other aspects of the standard and its applicability to other vehicle types have been responded to in the NHTSA's recent proposal for modification of the standard's performance levels for trucks, buses and trailers (40 FR 59222, December 22, 1975).

AM General asked whether buses manufactured during the suspension could be required to be retrofitted in the future. The answer is no. The motor vehicle safety standards in effect at any date apply according to their terms only to vehicles manufactured on that date. In answer to AM General's question whether the antilock system on 121-equipped buses may "be completely deactivated and dismantled and the vehicle returned to the pre-FMVSS #121 status," it is the position of the NHTSA that manufacturers and operators are the persons qualified and required to determine the safest configuration for operation of their vehicles, subject to applicable Bureau of Motor Carrier Safety regulations. With regard to the effect of Federal law on the modification of safety systems, a manufacturer of air-braked buses that conform to the air brake standard may instruct the owners of its products to disconnect the antilock system used to meet the standard, for the period necessary to correct a safety-related defect in the system that may make its operation hazardous.

It is also noted that this amendment constitutes the NHTSA's favorable response to APTA's October 6, 1975, request for modification of the standard, and the October 22, 1975, petition of the Eastern Bus Maintenance Men's Conference concerning Standard No. 121.

In consideration of the foregoing, S5.3.1 of Standard No. 121 (49 CFR 571.121) is amended by the addition of the phrase "Except for a bus manufactured before January 1, 1977, and" at the beginning of the first sentence.

Effective date: January 6, 1976. Because this amendment represents a relaxation of the requirements of the standard and does not place additional requirements on any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (14 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on January 6, 1976.

James B. Gregory
Administrator

41 F.R. 1598
January 9, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

(Docket No. 75–5; Notice 5)

Air Brake Systems

This notice amends Standard No. 121, *Air Brake Systems*, by extending until June 30, 1976, the period in which bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvest can meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

Standard No. 121, 49 CFR 571.121, presently permits this specialized agricultural trailer category the option, until March 1, 1976, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety requirements (49 CFR § 393.43). The NHTSA proposed extension of the March date to June 30, 1976 (41 FR 1763, January 12, 1976) to permit completion of the bulk agricultural commodity trailers necessary for the 1976 harvest season, in response to a petition of the Utility Trailer Manufacturing Company. In a separate action, the NHTSA has also proposed that the present parking brake requirements for all vehicles subject to the standard be broadened in a closely similar fashion to permit the use of an air energy source, with single diaphragm brake chambers as well as dual diaphragm brake chambers for actuation of the parking brake (40 FR 56920, December 5, 1975). It is clear, however, that separate and swifter action than the general proposal is necessary to permit the manufacture of trailers for the 1976 harvest.

Utility Trailer Manufacturing Company supported the extension of the period to June 30, 1976, and advocated extension of the option to all other air-braked vehicles. Wesco Truck and Trailer Sales (Wesco) also supported the proposal and suggested that a 2-year suspension of the standard would permit perfection of the new brake systems. Wesco recommended that the parking brake system be made optional on this type of agricultural trailer. Fruehauf Corporation supported the proposal without qualification.

In view of the comments received and the NHTSA's continued view that the special considerations for in-field use should be given to agricultural trailers with regard to parking brake requirements, the agency has decided to amend the standard as proposed. The other recommendations by Utility and Wesco are noted, but they do not fall within the limits of action proposed by the NHTSA.

In consideration of the foregoing, the last sentences of paragraphs S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) are amended by changing the date "March 1, 1976" to "June 30, 1976."

Effective date: February 26, 1976. Because this amendment creates no additional requirements for any person, and because trailer manufacturers need to know the extent of the option period as the basis for planning manufacturing schedules, an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on February 20, 1976.

James B. Gregory
Administrator

41 F.R. 8347
February 26, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 7)

This notice amends Standard No. 121, *Air Brake Systems*, to establish brake performance levels that are less stringent than existing levels. The amendments also affect towing vehicle performance and the effective date of the standard for certain categories of specialized vehicles.

The National Highway Traffic Safety Administration (NHTSA) proposed these modifications (40 FR 59222, December 22, 1975) in response to information developed at an October 1975 public meeting and other information collected by the NHTSA on field experience with implementation of Standard No. 121 (49 CFR 571.121). The proposal also responded to requests from Freightliner Corporation, PACCAR Corporation, White Motor Corporation, and the American Trucking Association (ATA).

CONSIDERATIONS UNDERLYING THE STANDARD

Under the National Traffic and Motor Vehicle Safety Act, as amended (the Act) (15 U.S.C. § 1381 *et seq.*), the Department of Transportation is responsible for the issuance of motor vehicle safety standards that, among other things, protect the public against unreasonable risk of accidents occurring as a result of the design, construction, or performance of motor vehicles. The Act directs the agency to consider whether a standard would contribute to carrying out the purposes of the Act and would be reasonable, practicable, and appropriate for a particular type of motor vehicle. 15 U.S.C. 1392(f)(3). The standard must, as formulated, be practicable, meet the need for motor vehicle safety, and be stated in objective terms. 15 U.S.C. 1392(a). The Senate Committee drafting the Statute stated that safety would be the overriding consideration in the issuance of standards. S. Rep. No. 1301, 89th Cong., 2d Sess. (1966) at 6.

Vehicles equipped with air brakes figure prominently in the highway safety hazards addressed by the Act. The National Safety Council (NSC) reports that more than 700,000 air-braked vehicle accidents, causing over 5,000 deaths, occur each year. *Accident Facts* 56 (1975). Accident figures show that heavy truck-trailer combinations are extremely hazardous to other highway users, and have a disproportionate involvement in fatal accidents. *Accident Facts* 56 (1975). Not only is their exposure greater because of the higher average mileage traveled, but they actually have a much higher rate of fatal accidents *per vehicle mile*, as shown by the preliminary report in a recent study by the Highway Safety Research Institute. "Highway Safety Effects of Energy Crisis on U.S. Toll Roads" (NHTSA contract in process at Highway Safety Research Institute). The NSC reports that the rate of involvement per vehicle in fatal accidents by truck-trailer combinations is nine times greater than the involvement by passenger cars. The fatality rate of heavy truck-to-car accidents is fourteen times greater than that of car-to-car accidents. "Truck Accidents in North Carolina," *Highway Safety Highlights*, Highway Safety Research Center, U. of N. Carolina (May 1975). Approximately 35 occupants of passenger cars are killed for every occupant of a heavy truck who loses his life in truck collisions with passenger cars on the interstate system. *Truck Accidents and Highway Safety—An Overview* 6 (1968); National Transportation Safety Board, *Special Study, Commercial Motor Vehicle Braking* 2 (Nov. 1972). Indeed, there are some indications that the involvement rate in accidents by truck-trailer combinations is increasing. "Highway Safety Effects of Energy Crisis on U.S. Toll Roads" (in process).

Faced with data showing the disproportionate hazards of heavy trucks on the highway, the National Highway Safety Bureau (predecessor agency to the NHTSA) initiated a program to improve the safety performance of these vehicles. There was no initial Federal motor vehicle safety standard applicable to air-braked trucks. At the inception of the regulatory development program, the agency solicited comments on several aspects of commercial vehicle safety (32 FR 14278, October 14, 1967) including brake systems, tires, and rear-underride protection. The engineering staff consulted with representatives of the heavy motor vehicle industry, reviewed existing data and literature, and issued several contracts to investigate the nature of the large vehicle safety problem. An advance notice of proposed rulemaking on coupled vehicle stability and control was issued in 1969 (34 FR 1055, January 23, 1969) to solicit the views of the industry and other interested parties on the means to reduce the number and severity of heavy vehicle accidents.

The determination of motor vehicle accident causation has been hampered by two basic difficulties. First is the absence of a representative broad-based body of highway accident data of sufficient detail to permit accurate discrimination of accident causation effects. Second is the undeveloped state of causation analysis methodology. Even if complete accident data were available, existing methodology provides no objective basis for quantitatively assessing the degree to which any prospective countermeasure would reduce the number or severity of crashes. The agency, therefore, had to rely on qualitative analysis, by its own and other researchers, of the limited available accident data on heavy vehicles.

Available evidence indicates that, relative to the lighter passenger cars sharing the highway, inferior braking and poor vehicle control of trucks during braking and turning maneuvers are substantial causes of heavy vehicle involvement in accidents. At the time the NHTSA first studied the problem, existing braking characteristics and performance of passenger cars and heavy trucks varied dramatically. Trucks generally are much heavier than passenger cars, have a higher center-of-gravity, and the axle-by-axle loads on trucks vary sharply between the loaded and unloaded conditions. *Bus, Truck, Tractor-Trailer Braking System Performance* 1, Highway Safety Research Institute, U. of Michigan (1971). Passenger cars' braking distances from 60 mph on a dry surface reported to NHTSA in 1975 by vehicle manufacturers range from 165 to 225 feet. *Brakes, a Comparison of Braking Performance for 1975 Passenger Cars and Motorcycles.* Truck-trailer combinations have average capabilities of approximately 300- to 350-foot stops under similar conditions, although some of the poorer-performing combinations take as much as 450 feet to stop from 60 mph. *Bus, Truck, Tractor-Trailer Braking System Performance.* Even the worst of these truck brake systems presumably met the only Federal braking requirements in effect at the time, those of the Bureau of Motor Carrier Safety (BMCS), which imposed requirements for stops from 20 mph. 49 CFR § 393.52.

Federal Highway Administration statistics demonstrate that, in rear-end collisions on the interstate system, vehicle types with the longest average stopping distances are also the vehicles with the highest rate of involvement in fatal accidents. *Public Roads 1969* Figure 9, and *Public Roads 1966* Figure 8. One study shows that, of 453 accidents involving one or more vehicles, more than three-fourths involved skidding, and loss of control occurred following application of the brakes in more than half of them. *The Importance of Loss of Directional Control in Car Accidents*, G. Grime (June 1963). NHTSA evaluation of BMCS statistics on selected major accidents of regulated carriers indicates that accidents involving "jackknifing" or other skidding, and collisions into the rear-end of vehicles, or into slowly moving or stopped vehicles, could often be reduced in severity or avoided altogether by improved vehicle stability and braking. This conclusion is supported by the National Transportation Safety Board, an independent agency that investigates major transportation accidents. *Special Study—Commercial Vehicle Braking 2* (November 1972). Independent researchers in State highway fatality statistics also conclude that improved braking and handling for truck-trailer combinations would improve overall highway safety. Lohman and Waller, "Trucks: An Analysis of Accident Characteristics by Vehicle Weight," U. of N. Carolina (September 1975); Baker, Wong, and Masemore, "Fatal Tractor Trailer Crashes: Considerations in Setting Relevant Standards" (July 1965).

Numerous research studies have investigated the questions of improved stability of heavy motor vehicles, particularly truck-trailer combinations, *e.g.*, "The Handling and Stability of Articulated Vehicles under Braking Conditions," F. D. Hales, et al. (January 1966). It is a universally accepted principle of vehicle dynamics that a prerequisite to the maintenance of stability and directional control of any automotive vehicle is that its tires continue rolling. A tire on a locked wheel can generate no lateral forces to affect its direction of motion. A vehicle whose wheels are locked is likely to slide sidewards as a result of such conditions as unevenness or banking in the road surface, wind forces, impacts on or by another vehicle or steering inputs by the driver as a result either of the emergency situation or of curves, *e.g.*, R.D. Lister, "Retention of Directional Control When Braking," SAE Paper 963A (January 1965); "Measurement of Vehicle Response in Severe Braking and Steering Maneuvers," Dugoff, et al., SAE Paper 710080 (January 1971).

Consultation with the truck manufacturing and user industry, and a major research contract on heavy vehicles for the agency, demonstrated that improved systems were available to increase heavy vehicle stopping control. *Truck, Bus, Tractor-Trailer Braking System Performance*, U. of Michigan (1971). Improved fade resistance, improved actuation and release times, greater air reservoir capacity, and partial failure performance are elements of such improved braking. Most important were more effective brakes to reduce the disparity in stopping capabilities between passenger cars and heavy vehicles, and provision against wheel lockup during braking in order to prevent the vehicle from skidding out of control. The ATA, in its comments on the 1967 notice concerning truck braking, recommended that consideration be given to "antilocking brake devices." See NHTSA public docket. Comments received in response to the agency's 1969 notice on coupled vehicle stability and control confirmed that better brake performance was possible and that various devices to reduce chances of wheel lockup were available. Meetings with an "outside task force" of interested industry representatives and with individual manufacturers also showed the technical feasibility of improved braking systems.

In view of the available technology to improve heavy vehicle braking and vehicle control, and the over-involvement of air-braked vehicles in highway crashes that could be avoided or reduced in severity by better braking and vehicle control systems, the NHSB in 1970 proposed braking performance standards for air-braked trucks, buses, and trailers. The agency action was also motivated by the attempts to increase permissible size and weight of commercial vehicles on the interstate highway system (a weight increase to 80,000 pounds gross vehicle weight rating has occurred since proposal and implementation of the standard). Standard No. 121 was issued in February 1971, and was implemented for trailers on January 1, 1975, and for trucks and buses on March 1, 1975.

Although the standard involves numerous aspects of air brake systems, the most important and controversial provisions of the standard are those that require improved stopping capability and "no lockup" performance. Section S5.3.1 specifies stopping in limited distances from 20 and 60 mph, in the loaded and unloaded conditions on wet and dry surfaces, with the vehicle remaining in a 12-foot-wide lane and with limits on wheel lockup. It is the stopping limits and "no lockup" requirements that are the source of the basic issues concerning the standard.

The agency established a stopping distance requirement of 245 feet from 60 mph on a dry surface with the vehicle loadeed. The stopping distance of passenger cars under comparable conditions averaged approximately 200 feet, with many vehicles bettering that mark. By mandating 245 feet as a minimum requirement, the standard improved the safety of air-braked vehicles in two ways. The minimum distance requirement placed a floor on stopping distance performance and eliminated the vehicles that were built with extremely long stopping distances. More importantly, it mandated a substantial reduction in the disparity of braking performance between passenger cars and heavy vehicles as a whole.

While all elements of the industry supported the principle of minimum stopping distance requirements for air-braked vehicles, questions arose following issuance of the standard and before implementation as to the technological feasibility for mass-produced vehicles of the level set in the standard. The Act requires that safety standards be "practicable."

The basic NHTSA contract and other test data underlying the standard demonstrated that some pre-121 production vehicles already approximated the stopping distance requirement of 245 feet. But manufacturers that had stated they could provide the minimum stopping distance of 245 feet discovered that the traditionally weak front axle brakes on many trucks would have to be substantially upgraded, in some cases more than had originally been anticipated. Although the NHTSA implemented the standard with a 258-foot interim stopping distance to accommodate mass production start-up problems, front axle brakes on some vehicles were still overdesigned, and for two basic reasons. The source of the problem was not technological unfeasibility of producing the desired handling characteristics, which are available in many 121-equipped vehicles produced since March 1, 1975. Rather, it appears that some manufacturers sought to ensure 100-percent compliance with the standard by concentrating on utilizing a few new axle and brake assemblies that were sufficiently aggressive to manage the braking force for an entire line of vehicles. In addition, the unanticipated degree of variability in performance of some mass-produced components forced larger "compliance margins" of over-performance, to assure that each vehicle produced would meet the minimum performance level of the standard.

The NHTSA responded to the evidence of adverse handling in some manufacturers' production by increasing stopping distances to 277 feet until January 1, 1978 (40 FR 38160, August 27, 1975). This action was supported by manufacturers but failed to encourage sufficiently the "depowering" of front axle brakes. The agency therefore proposed new established values (not limited to an interim period) in a proposal discussed in detail below.

Thus, while the stopping distances established by the standard have always been fully justified in safety need and technological feasibility, the agency has responded several times to evidence that some manufacturers were having difficulty in improving their worst-performing vehicles enough to satisfy the standard. The availability of mass-produced vehicles from some manufacturers that meet the 245-foot requirement without adverse handling (see Docket 75-16; Notice 02-125) demonstrates that the present proposed distance is undoubtedly achievable in advancing motor vehicle safety.

The other major provision that has raised issues in implementation of the standard is the requirement limiting lockup of wheels during the stops mandated by the standard. As explained earlier, the limitation on lockup is intended to increase the stability and directional control of heavy vehicles during braking and turning maneuvers. Most manufacturers utilize antilock systems to provide the required "no lockup" performance, although other devices (such as load-sensitive proportioning devices) may be capable of providing the specified performance. The systems are installed to momentarily and automatically release the brakes to avoid skidding in cases where the brake application is so strong, or the road surface so slippery, that wheel lockup would normally occur. Some manufacturers and users have reported that some of the antilock systems that have been installed do not function correctly and that malfunction makes 121-equipped vehicles less safe than pre-121 vehicles. These commenters argue that for this reason the standard does not meet the need for motor vehicle safety as specified in the Act.

Standard No. 121 meets the need for motor vehicle safety by specifying "no lockup" performance that increases directional stability and control of heavy motor vehicles to reduce their involvement in highway accidents. The decision by some manufacturers to choose a type of antilock that malfunctions or is not suited to their products does not mean that the standard fails to meet the need for motor vehicle safety. That conclusion could be drawn only if the safety performance specified were not in fact practicable. The fact that thousands of vehicles have been manufactured with antilock systems that have not reported any safety-related defects clearly shows that the standard is practicable. The position that a manufacturer's failure to build a reliable product could of itself defeat the validity of a standard would place in the hands of the regulated industry the decision to implement, continue in effect, or cancel any safety standard.

The NHTSA has monitored the test programs of antilock manufacturers to ensure that reliable systems were introduced. Proprietary data on antilock test programs are included in the administrative record of this standard.

The NHTSA has taken appropriate action in the case of antilock malfunction that poses a potential safety hazard. In cases where the malfunction has momentarily released the brakes under some circumstances when they should remain applied, the agency has suspended the standard's requirements for a period to permit development of solutions to the design deficiencies involved (41 FR 1598, January 9, 1976). Most antilock malfunctions simply cause the system to disable itself and return braking to normal. Users have expressed the fear that, with disabled antilock, severe brake applications will cause wheel lockup and cause the vehicle to lose control and become a hazard on the highway. The NHTSA considers these fears unrealistic, because of the extremely limited cases in which the problem would arise.

The circumstance where a 121-equipped vehicle is significantly more likely to lock up than a pre-121 vehicle is on the front axle because of the generally stronger brakes. But the possibility of this occurring is prevented at low pedal applications by the provision of "automatic pressure limiting valves" that reduce or eliminate the brake pressure to the front axle during the great majority of brake applications. Also, a warning signal on the instrument panel advises of antilock electrical failure and gives advance notice to the driver in all cases except the statistically rare occasions when antilock fails during a panic brake application. In view of the benefit of functioning antilock and the extremely small chance that a driver would not be warned before use of the brakes in a panic stop, the NHTSA evaluates the risk of malfunction as small and outweighed by the benefits of the antilock requirement.

Many commenters at the October 1975 public meeting suggested that hundreds of reliability problems with safety consequences have occurred in antilock components used to meet the standard. The Act requires vehicle and equipment manufacturers to report such safety-related defects that develop in their products, to the NHTSA and the agency has carefully monitored reports concerning antilock reliability. To date, only nine such safety-related defects have been reported, and the majority of them were limited to minor start-up problems in the mass-production process that were easily corrected.

NOTICE 05 PROPOSAL

Vehicles produced to meet the standard are now in service and available for comprehensive evaluation. Reports on vehicle performance were received at a public meeting on implementation of the standard in October 1975. Other reports have been made directly to the agency. The NHTSA has been testing 121-equipped vehicles at its Safety Research Laboratory since production vehicles have become available. In September 1975, the agency discussed implementation of the standard with all antilock manufacturers and several major vehicle manufacturers.

The NHTSA has determined that some vehicles produced to comply with the standard demonstrate unsatisfactory handling characteristics. The source of the problem is not technological unfeasibility of producing vehicles with desirable handling characteristics, as demonstrated by many of the 121-equipped vehicles produced since March 1, 1975. Rather (as noted earlier), it appears that some manufacturers sought to ensure 100-percent compliance with the standard by concentrating on utilizing a few new axle and brake assemblies that were sufficiently aggressive to manage the braking force for an entire line of vehicles. In addition, the unanticipated degree of variability in performance of some mass-produced components forced larger "compliance margins," to assure that each vehicle produced would meet the minimum performance level of the standard. The brake imbalance that exists in any braking system (due to production variations) is of course magnified as the brakes become more effective.

While it would be possible to require redesign of the vehicles to eliminate these characteristics, the agency considers this course of action unduly costly in view of the economic situation of the heavy truck industry. Large sums have already been expended by vehicle manufacturers to achieve compliance with the standard. The agency has decided that it should instead reduce the performance levels of the standard somewhat to permit the "depowering" of the steering axle brakes sufficiently to improve handling characteristics while design problems are being resolved by the manufacturers.

The agency has evaluated the comments submitted by vehicle manufacturers and users, equipment suppliers, the International Brotherhood of Teamsters, and the Commonwealth of Pennsylvania. The NHTSA concludes that the proposal should be made final as proposed, with only a few modifications. While commenters expressed differing views on what other modifications of the standard might be beneficial to motor vehicle safety, they supported, with few exceptions, the proposed performance levels as a feasible technical level that would contribute to motor vehicle safety. A commonly expressed view was the need for stability in the performance levels of the standard as the basis to get the truck industry back into a healthy sales posture. Ford, for example, stated that it "trusts that the Administration will recognize the need to proceed cautiously to avoid further disruptions of the heavy truck business."

Because the comments generally agreed that the 293-foot stopping distance would accomplish the NHTSA's goal to permit depowering front axle brakes enough to eliminate handling problems, the stopping distance requirement is amended as proposed. Freightliner Corporation, which petitioned for these stopping distances, noted, "The proposed loaded vehicle stopping distances provide a realistic basis for establishing minimum service brake stopping distance requirements."

Oshkosh Truck Corporation disagreed with the proposed distances in the case of straight trucks, with the view that the problems raised at the October 1975 public meeting apply only to buses and tractor-trailer combinations. Oshkosh pointed to the adequacy of its brake systems and noted that the earlier increase in permissible stopping distances from 245 feet to 277 feet should provide for any "compliance margin" for problems being experienced.

The NHTSA does not question the superior handling characteristics of Oshkosh vehicles, but acts from a concern over axle systems designed for the entire vehicle population, including many vehicles that are different from Oshkosh products. It is an unfortunate effect of reducing the requirements for all vehicles that manufacturers of the better-designed vehicles, such as Oshkosh, may feel forced by commercial considerations to downgrade the braking abilities of their products.

The Commonwealth of Pennsylvania, citing examples from its accident files of light vehicles being struck from the rear by heavy trucks, expressed strong concern over the proposal for an increased stopping distance. The NHTSA shares this concern. The countervailing considerations cited above lead to a reduction in the basic braking performance that has up to now been required by Standard 121. However, this agency has determined that the 293-foot minimum requirement, along with the many other requirements of the standard, will nevertheless substantially increase the braking capability of air-braked vehicles compared to that prevailing before the standard went into effect. The standards also continue to prevent the manufacture of those 3-axle trucks that have grossly inferior braking capability.

The International Brotherhood of Teamsters expressed continued support for the standard, urging more stringent performance levels in the future. As the proposal noted, far more information will be available in the future as the basis for further changes of the stopping distance performance levels, including the statistical evaluation of pre-121 and 121-equipped vehicles in the field. The NHTSA believes that further notice and the opportunity for comment should precede any future changes of the stopping distance requirements.

Vehicle manufacturers conducted as much testing as possible, during the winter months, of the proposed new loaded-vehicle stopping distances. Most concluded that the unloaded stopping distance (258 feet versus 293 feet) would interfere with their efforts to "depower" braking sufficiently to reduce the possibility of adverse handling. The data on which the NHTSA based its proposal did not indicate that unloaded stopping distances would require relaxation in order to accomplish the desired depowering. Typically, unloaded performance is substantially superior to loaded performance and justifies shorter stopping distance requirements.

The ATA pointed out that as one braking characteristic is changed its effect on other characteristics is unpredictable. In this case, it appears that the recent testing demonstrates a sensitivity of unloaded to loaded stopping distance that has not been fully appreciated until now. To implement the NHTSA intention to permit sufficient "depowering" for improved vehicle performance, the agency concludes that the required unloaded stopping distance should be made equal to the loaded vehicle distances, as recommended by Ford, PACCAR, Freightliner Corporation, and Midland-Ross. Other manufacturers also stated that the shorter unloaded stopping distances could constitute a problem. The NHTSA considers it necessary, in light of this information, to increase the unloaded as well as loaded vehicle stopping distances. Table II is amended accordingly.

In view of this modification, the proposed exclusion of certain specialized vehicles from the unloaded stop (proposed S5.3.1.3) is unnecessary and therefore not adopted.

Wagner and some other commenters made the incorrect assumption that the NHTSA was concerned only with loaded-vehicle stopping performance of 121-equipped vehicles. While the agency's proposed action only addressed loaded distances, the express purpose was to permit "depowering" for improved handling under all conditions. Wagner's view that the NHTSA intended the use of antilock for unloaded vehicle stops is incorrect. Actually, the NHTSA anticipates that the depowering will have the effect of eliminating the need for antilock (or other mechanical means for preventing uncontrolled wheel lockup) under all conditions in the case of many vehicles.

Besides the many recommendations to specify comparable unloaded stopping distance requirements, commenters made varying suggestions for further change in stopping performance requirements. Consolidated Freightways called for deletion of the "antilock requirement" or, in the alternative, for cancellation of the standard. Its truck-manufacturing subsidiary (Freightliner Corporation) also called for prohibition of front axle brakes on three-axle truck-tractors. The ATA called for stopping distances that would guarantee deletion of front axle antilock. Mack Trucks, Inc., asked for deletion of the requirement for "no lockup" performance on the front axle. White Truck Corporation asked for longer distances in some cases. International Harvester asked for a 330-foot stopping distance, or a more fundamental revision of the standard proposed by the company in December 1974. Ford requested that one wheel be permitted uncontrolled lockup during stopping tests, and suggested further rulemaking to "remove the need for antilock on all front axles." Bendix Corporation suggested suspension of the service brake stopping distances and "no lockup" requirements for trucks.

The NHTSA judges that these requests are not directed at the "depowering" of overly effective brakes intended by the NHTSA proposal. For the most part, the recommendations appear to promote deletion of front axle antilock from certain trucks that may not allow a controlled "no lockup" stop without the system. Consolidated Freightways, Bendix, and Roadway Express argued for deletion of antilock from the entire vehicle. At least in the case of these three requests, the concern is apparently based on the continued argument as to the reliability of antilock. In the proposal underlying this rulemaking, the NHTSA explained the basis for its determination that antilock is reliable, and since that time the agency has not developed or had reported information which modifies that view. An additional safety-related defect report, involving potential radio frequency interference with antilock function in one vehicle manufacturer's products, has been reported, but no report of any accidents resulting from the defect has been made. The NHTSA maintains its conviction that antilock is sufficiently reliable to justify its continued installation in satisfaction of the standard's requirements for directional stability. Accordingly, the agency does not act on the recommendations for deletion of the "no lockup" requirements or for distances calculated to eliminate the significance of the "no lockup" requirements. Consolidated's legal arguments on NHTSA rulemaking are being considered in the separate judicial review of Standard No. 121 and are not discussed in this notice for that reason.

Freightliner suggested relaxation of emergency braking distances, and PACCAR recommended that the 35-foot stop from 20 mph be made a 40-foot stop. The NHTSA did not propose these changes and does not believe them to be necessary for the "depowering" intended by the proposal. The 40-foot level would be no improvement over regulations existing prior to Standard No. 121. Furthermore, the agency gathers from the comments submitted that most elements of the industry desire certainty in the standards to return stability to the truck manufacturing process. In the interests of this certainty, the agency does not intend to further consider the Freightliner and PACCAR requests.

Along with the stopping distance modifications, the NHTSA proposed conforming changes in the dynamometer requirements. Brake fade and recovery levels would be reduced somewhat by the proposal, the "hot stop" requirement would be deleted, and recovery requirements for the front axle of truck-tractors would be deleted. These proposals were intended to permit "depowering" of brakes to the 293-foot stopping-distance level.

Rockwell International Corporation, a major supplier of foundation brakes and axle systems to the heavy vehicle industry, doubted that the dynamometer requirements would conform perfectly to the new vehicle stopping distance requirements. Rockwell estimated that 10 to 12 months might be required to accomplish adequate testing and reevaluation of brake sizes. The company suggested that all dynamometer requirements be suspended for an indefinite period.

The NHTSA did not propose such a broad revision of the standard and would have to propose such changes before they could be implemented. Furthermore, a suspension of requirements without certainty as to their status at an unknown future date would reintroduce an element of uncertainty that Rockwell and many others cautioned against. For this reason, the modifications are implemented as proposed, and the NHTSA does not intend to act on Rockwell's recommendation.

No objections were received on the general reduction of brake fade and recovery performance and the air pressure values are amended as proposed. The ATA noted its support of the new values only if it permitted front axle brakes without antilock. Vehicle manufacturers generally stated that limited testing did not permit unqualified endorsement of the new values. The California Department of Highway Patrol (CHP) suggested that a change of deceleration rate would be more realistic than the proposed change of air pressure actuation. In response to the CHP concern, it is noted that the increase in air pressure was chosen as the means to revise requirements so that the years of data developed in the past could be used for calculations of the new values. The NHTSA agrees with the CHP that a reduced deceleration rate would be more realistic if it were a feasible choice.

The "hot stop" deletion was also supported, though most comments on the proposal stated that the whole section should be deleted and not simply the last sentence. The NHTSA purposely did not delete the whole section, so that the sequence of testing would remain as in the past, to preserve the data on recovery that was developed following "hot stop" testing. Therefore the required test level is deleted as proposed, but the testing remains in the standard to maintain the same sequence as in the past.

The deletion of recovery requirements on the front axle of truck-tractors was also supported, as it was discussed in the preamble. The proposed language incorrectly executed the NHTSA's intent as expressed in the preamble. With the necessary corrections, the proposals are made final as proposed. The CHP suggested an easing of "hot stop" requirements in place of deletion, but the agency does not consider it has a sufficient basis for the choice of new values, given the other reductions in dynamometer stopping distance values.

The agency proposed reduction of retardation force requirements in the case of trailers to maintain balance with the longer distances permitted for trucks. The modifications were supported, although K-B Axle Company qualified its support by noting that conforming linings might not be available immediately. The company suggested suspension of trailer retardation requirements. The NHTSA does not consider this suggestion meritorious, because it would leave no assurance of continued compatibility between the truck and trailer.

Based on further testing, Rockwell supplemented its original comments with a request for somewhat lower trailer retardation force levels than the 0.43 value proposed. The company justified a 0.40 value, based on variability experienced in the new testing. A second manufacturer of trailer axles (Eaton Corporation) supported a 0.40 value in meetings with the NHTSA. The new retardation values are therefore implemented as proposed although at slightly lower values. In response to the CHP question concerning the need for numbering columns, these designations are necessary so that any future revision can be easily noted with precision.

The NHTSA proposed reduction of parking brake performance levels for vehicles that operate in combination, so that the vehicles, taken together, would produce approximately the same holding power as single-unit vehicles. Although petitioners PACCAR and Freightliner asked for reduction of grade-holding levels for all vehicles (and repeated these requests in their comments), the NHTSA rationale for the proposal was to accomplish the far more limited purpose of reducing the cost and weight of 121-type parking brake systems on high-mileage tandem-axle vehicles that operate in combination.

As proposed, however, the proposal applied to towed and towing vehicles with a single non-steerable axle as well as those equipped with tandem-axle assemblies. It is obvious that the desired cost and weight reduction intended in the proposal (typically removal of one set of spring brakes from one axle) cannot be achieved on a vehicle with only one non-steerable axle. At the same time, the proposal would permit less powerful parking brakes on this vehicle category. The CHP pointed out that these single non-steerable-axle vehicles are commonly operated in doubles operation, when parking brakes become more important in view of the total combination grade-holding ability. The NHTSA concludes that the proposal in the case of vehicles with single non-steerable axles will not accomplish the intent of the proposal and is therefore withdrawn.

It also became apparent that the proposed reduction in parking brake retardation force for tandem-axle trailers could not be justified. The proposed change from a 0.28 value to a 0.23 value was calculated on the basis of the share of a full load that the typical trailer should hold in combination with a truck-tractor to equal the performance of single-unit vehicles. No petitions were received requesting the modification, but possible weight and cost reductions were considered possible. Fruehauf Corporation supported the proposal, while the Truck Trailer Manufacturers Association stated that cost savings were unlikely from the proposed change.

Unlike trucks and buses, trailers utilize the parking brake system as an emergency braking capability, in case of trailer "breakaway" or other failure of the service brake system. This parking brake system and emergency capability utilize the service brake friction elements and are thus directly dependent on the effectiveness of the service brakes. In view of the NHTSA decision to reduce trailer service brake effectiveness somewhat more than proposed, the agency considers that the vehicle's emergency braking capability would be reduced too much by a commensurate reduction of parking brake requirements. Therefore the parking brake proposal for trailers is withdrawn.

As for the tandem-axle truck-tractors for which the proposal was intended, it appears that the NHTSA estimate of a 0.17 retardation value was somewhat too high to accomplish the proposal's intent. PACCAR made several objections to any specification beyond that necessary to hold on a 15-percent grade. The company's testing showed that variability in materials and other factors required a 0.148 value in place of 0.17. Freightliner recommended a 0.16 value. White Motor asked for a .15 value and Rockwell recommended a .13 value. International Harvester supported the modification as proposed. NHTSA evaluation of submitted data indicates that a small decrease in the value from 0.17 to 0.14 is necessary to permit the intended deletion of parking brake actuation mechanisms. Accordingly, the parking brake option of S5.6.1 is amended to reduce the retardation forces for tandem-axle truck-tractors.

The CHP made extensive and detailed comments on the parking brake proposal which have been evaluated by the NHTSA. The CHP submission assumed that only one non-steerable axle on buses and single-unit trucks would be equipped with parking brakes. This assumption apparently arose from a rearrangement of the wording of S5.6.1 that resulted in moving the phrase "on any axle other than a front steerable axle" in one subsection of the proposed modification. All other commenters understood the rearrangement and based their comments on the requirements as they have always existed for buses and single unit trucks.

In response to a petition from the ATA, the agency proposed a 0.20-second limit on minimum brake actuation timing of towing vehicles. The ATA asserted that the compatibility of towed and towing vehicles would be improved by a limit on minimum actuation speeds as well as the minimum actuation timing already specified. Responses on the proposal by the manufacturers of brake components and of air-braked vehicles generally opposed the imposition of minimum actuation times. Of the manufacturers that commented, Rockwell supported the proposal without stating its rationale, and PACCAR and Freightliner stated qualified support for a minimum value, if the limit on maximum actuation times was raised or eliminated. The CHP supported the proposal, although its engineering calculations were not expressed.

From the comments submitted, the NHTSA concludes that a minimum actuation time is an insufficient means to assure compatibility, and that further study of adequate means is advisable. Midland-Ross Corporation reminded the agency and industry that trailer response time is a separate but important portion of the problem. International Harvester argued that a limit on minimum actuation time might inhibit other modifications to improve compatibility. For these reasons, the proposal to impose minimum actuation times is withdrawn.

Manufacturers indicated that the 0.40 maximum actuation time was discouraging the slower actuation time desired by the ATA. The agency concludes that the ATA request can in part be met by an increase in permissible actuation time in place of the requested limitation on minimum actuation times. For this reason, the maximum permissible actuation time for trucks and buses is modified to 0.45 seconds from 0.40 seconds (S5.3.3).

The delayed effective dates for certain categories of specialized vehicles were also addressed by the proposal. In view of the uncertainty introduced by the proposal regarding the performance levels, the agency considered it necessary to delay the effectiveness of the standard further for these vehicle classes.

Reaction to this proposal in the case of fire-fighting vehicles (delay from March 1, 1976, to September 1, 1977) was not uniform. The Fire Apparatus Manufacturers Division of the Truck Body and Equipment Association supported the delay because custom vehicles utilize Rockwell antilock systems similar to those utilized on some buses. In the cases of buses, a major provision of the standard was suspended for a 1-year period to permit resolution of certain problems in the antilock system. Several small manufacturers also supported the delay. Other manufacturers indicated their readiness to meet the standard and asked that it not be delayed. Oshkosh has been building 121-equipped vehicles for some time and stated its reliance on the March 1, 1976, date as the basis for preparations to commence production of the new systems in fire trucks by March 1976. American-LaFrance, a large manufacturer of fire fighting vehicles, also requested implementation of the standard as scheduled for fire fighting vehicles.

In view of the statements of readiness by fire fighting vehicle manufacturers, the NHTSA has concluded that the standard should be implemented as soon as possible. The Rockwell antilock system on trucks has not evidenced reliability problems like those on buses that would justify a suspension of the requirements that underlie their use. However, the NHTSA proposal has justifiably permitted manufacturers to modify their plans and readiness, and the agency concludes that a short delay is necessary to allow preparations for the standard's implementation. Accordingly, the effective date for fire fighting vehicles is delayed from March 1, 1976, to June 1, 1976.

The Heavy Specialized Carriers Conference of the ATA, Fruehauf Corporation, the Truck Trailer Manufacturers Association, and Birmingham Manufacturing Company all supported the proposed delay until September 1, 1977, of the standard's applicability to heavy hauler trailers. No objections were received on the proposed delay for auto transporters and vehicles with a gross axle weight rating (GAWR) for any axle of 24,000 pounds or more, or two or more front steerable axles with a GAWR of 16,000 pounds or more for each axle. White Motor Corporation supported these delays as the minimum necessary, and supported a similar delay of the standard's full requirements for certain vehicles listed in S5.3.1.2. In view of the comments, the delays are made final as proposed.

The CHP expressed concern that other large and specialized vehicle categories are permanently excluded from the standard. The CHP anticipates that, in the absence of Federal requirements, a number of State regulations could be developed, some of which might be inadequate to ensure safety. The NHTSA is sympathetic to the concern, but at this time, considers it unwise to initiate the suggested rulemaking. Large axle and brake suppliers like Rockwell are absorbed in making calculations for the changes already proposed, and any further changes should await more deliberate and thorough review when more time is available. It is noted that American-Coleman has filed a petition for the exclusion of more vehicles from the standard. Until these conflicting requests are resolved, the CHP correctly notes that the States may continue to enforce their regulations against these vehicles.

With regard to heavy vehicles, the CHP asked for a clarification of the limits on what constitutes the "rated cargo load" in the NHTSA definition of "unloaded vehicle weight." The NHTSA permits the rated cargo load and the gross vehicle weight rating to be determined by the manufacturer. If the CHP believes it has a better means of making that determination, its suggestion will be considered when received.

Certain test procedures were questioned by commenters. Wagner asked for confirmation that unloaded truck-tractor tests do not include the use of an empty control trailer. Wagner is correct. Mack and Roadway Express suggested that unloaded vehicle tests should be run with the empty control trailer attached. This modification has not been proposed and will not be acted on. With the increased unloaded vehicle stopping distance requirements, the NHTSA finds that the generally longer "bobtail" truck-tractor stopping distances should not interfere with adequate "depowering" of overly effective brakes.

For testing, the NHTSA proposed that the control trailer braking capabilities remain at the same level as in the past, instead of being reduced to conform to the proposed longer stopping distance requirements of S5.3.1. As Wagner recognized, this proposal was intended to permit the continued usefulness of past test data in making new calculations of necessary towing vehicle capabilities. Wagner, Bendix, and the ATA warned that the values will no longer be representative of equivalent production trailer stopping capabilities. Vehicle manufacturers supported the continued use of the existing control trailer performance. The NHTSA concludes that, although the control trailer will be somewhat less realistic than is normally desirable, this consideration is outweighed by the importance of maintaining the usefulness of the large amount of data already developed in the years of preparing for implementation of the standard. Therefore the control trailer specification remains as it has in the past.

The CHP requested that certain abbreviations in the standard be made uniform, and Wagner suggested that the standard be published in its entirety. The NHTSA anticipates these actions at the time of the next codification.

The ATA questioned the statement that European braking practice differs from the traditional practice in the United States of weak front brakes. In response, the NHTSA notes the recent Commission of European Commities directive for improved vehicle capability specified a higher retardation ratio for the front axle of commercial vehicles than on the rear axle.

The Truck Equipment and Body Distributors Association did not state its position on the proposals made, but indicated that the requirements of the standard as a whole present too great a burden on the association's membership. This issue is being litigated in the suit for review of the standard and, for this reason, is not discussed in this notice.

In light of the foregoing, amendments are made in Standard No. 121, *Air Brake Systems*, 49 CFR 571.121 . . . .

Effective date: February 26, 1976. Because these amendments effect the relaxation of requirements and create no additional burden upon any person it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on February 26, 1976.

James B. Gregory
Administrator

41 F.R. 8783
March 1, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket Nos. 75–7; 75–16; Notices 3 & 9)

This notice republishes in their entirety Standard No. 105–75, *Hydraulic Brake Systems*, and Standard No. 121, *Air Brake Systems*, because the number and complexity of recent amendments to these standards may have created confusion for some interested persons.

Standard No. 105–75 (49 CFR 571.105–75) was issued September 1972 (37 FR 17970, September 2, 1972) and has been amended numerous times since issuance. Although an up-to-date and complete text of the standard appears each year in the republished Code of Federal Regulations, several complex amendments have been made to the standard in the past year that are not reflected in the most recent up-to-date text. To assist interested persons who must be certain of the text's provisions, the agency herewith publishes the standard in its entirety. Interested persons are advised that amendments of Standard No. 105–75 may occur in the future, although no proposals are outstanding at this time.

In a related matter, General Motors Corporation has brought to the agency's attention an inadvertent deletion of one sentence from one section of Standard No. 105–75. A statement was added to the text of S5.1.5.2(a)(2) to permit an interim increase in permissible control force for the fifth wet recovery stop (40 FR 24525, June 9, 1975). Inadvertently, this sentence was deleted from S5.1.5.2(a)(2) in a subsequent rulemaking action (40 FR 42872, September 17, 1975), although the preamble to the notice made clear that "The new wording in no way modifies the meaning of S5.1.4(a)(2) and S5.1.5.2(a)(2)." To correct this omission, the sentence appears in this publication. It has been moved to S5.1.5.2(a)(1) because it concerns the maximum pedal force limit in that section, rather than the minimum pedal force limit in S5.1.5.2(a)(2) where it appeared in the past.

Standard No. 121 (49 CFR 571.121) was issued in February 1971 (36 FR 3817, February 27, 1971) and has also been amended numerous times since issuance. Several amendments have occurred since the most recent publication of the standard in its entirety. For the reasons cited with regard to Standard No. 105–75, the agency herewith publishes the standard in its entirety. Interested persons are advised that three proposals to amend the standard are outstanding (40 FR 45200, October 1, 1975) (40 FR 56920, December 5, 1975) (41 FR 20706, May 20, 1976) and that amendments to the text of the standard may be made in the future.

It has also been noted that a clarification could be made to the language of S3 of the standard that excludes until September 1, 1977, vehicles that combine with other vehicles to form auto transporters. The temporary exclusion was added to the standard in January 1975 (40 FR 1246, January 7, 1975). To make the effect of that action more clear the language in the second sentence of the text "or to any vehicle which" is changed in this republication to read "or that." This modification of the language has no effect on the requirements of this standard and notice and opportunity to comment are therefore found to be unnecessary.

In consideration of the foregoing, Standard No. 105–75 (49 CFR 571.105–75) and Standard No. 121 (49 CFR 571.121) are republished . . . .

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegations of authority at 49 CFR 1.50 and 49 CFR 501.8.)

Issued on June 30, 1976.

Robert L. Carter
Associate Administrator
Motor Vehicle Programs

41 F.R. 29696
July 19, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75-5; Notice 7)

This notice amends Standard No. 121, *Air Brake Systems*, to extend until June 30, 1977, the period in which bulk agricultural commodity trailers designed with a high ground clearance and other special features for use with farm tractors during harvest can meet emergency and parking brake requirements other than those specified in S5.6 and S5.8 of the standard.

Standard No. 121 (49 CFR 571.121) permitted this specialized agricultural trailer category the option, until June 30, 1976, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety requirements (49 CFR 393.43). The National Highway Traffic Safety Administration established the June 30, 1976, date (41 FR 8347, February 26, 1976) to permit completion of the bulk agricultural commodity trailers necessary for the 1976 harvest season.

Titan Trailer Corporation petitioned for a year's extension of the option because the reasons cited by the agency for the option still exist, and the company plans to manufacture the specialized vehicles throughout the year.

The agency does not wish to limit the manufacture of these trailers to only one of the available systems. In fact, the agency has an outstanding proposal to broaden the available means to meet the parking and emergency brake requirements for all trailers in a closely similar fashion to the bulk agricultural trailer option (40 FR 56920, December 5, 1975). Because of the comprehensive nature of that proposed revision, it will not be acted on in the immediate future. The NHTSA concluded that the option should be extended for a period to permit the continued manufacture of these trailers as they have been manufactured. The extension was proposed July 6, 1976 (41 FR 27740).

Comments were received from Utility Trailer Manufacturing Company, Fruehauf Corporation, and Wesco Truck and Trailer Sales. All comments supported the proposal, and it is made final as proposed.

In accordance with recently enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16200, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of the proposal on the public and private sectors, including possible loss of safety benefits. Because the option simply permits continued manufacture of these trailers in the same fashion as they have been manufactured to date, and because the possibility for misuse of the mechanical parking brakes appears to be great in this case, the agency concludes that there would be no new economic or environmental costs imposed by the action, and that there would be no significant loss of safety benefit in this case.

In consideration of the foregoing, the last sentence in paragraph S5.6 and S5.8 of Standard No. 121 (49 CFR 571.121) is amended by changing the date "June 30, 1976" to "June 30, 1977."

Effective date: September 24, 1976.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on September 22, 1976.

John W. Snow
Administrator

41 F.R. 43153
September 30, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 10)

This notice amends Standard No. 121, *Air Brake Systems*, to extend from January 1, 1977, to September 1, 1977, the existing suspension of service brake stopping distance requirements as they apply to buses. Editorial changes are also made.

Equipment used in transit and intercity buses to conform to the stopping distance requirements (S5.3.1) of Standard No. 121 (49 CFR 571.121) demonstrated a pattern of erratic behavior following implementation of the standard for buses on March 1, 1975. For this reason, the agency suspended these stopping distance requirements (including the "no lockup" requirement) to provide a period in which modified antilock hardware and newly introduced systems could be field-evaluated (41 FR 1598, January 6, 1976). Based on a petition for a longer suspension and on the agency's conclusion that the experience of a full year of antilock operation in all environmental conditions would be necessary to generate and analyze adequate data to make a sound decision in time to permit orderly planning of bus production, a further suspension to September 1, 1977, was proposed (41 FR 20706, May 20, 1976).

Comments were received from vehicle manufacturers and users, and from the two antilock system manufacturers that provide components for transit and intercity bus antilock systems. The National Motor Vehicle Safety Advisory Council did not take a position on the proposal. The Vehicle Equipment Safety Commission did not comment on the proposal. Interested persons are advised that Docket Nos. 74–10 and 75–5 are related to the subject of air brake system requirements.

The comments generally supported the proposed extension, and no commenter opposed the additional eight months for evaluation. AM General Corporation and Crown Coach requested that the suspension be extended to January 1, 1978, but did not provide data that would substantiate the need for additional time. Freightliner Corporation, Rockwell International, and the American Public Transit Association (APTA) recommended that the stopping distance requirements for buses be indefinitely suspended until justification for them is articulated, analysis of their "costs and other consequences" is set forth under Department of Transportation (DOT) policies (41 FR 16200, April 16, 1976), and extensive antilock system tests and evaluation have been completed.

The requests by Freightliner, Rockwell, and APTA demonstrate a possible misunderstanding of the regulatory action under consideration, and the agency therefore takes the opportunity to put it in perspective. The stopping distance requirements of Standard No. 121 are in place for buses, and the only modification in the standard being considered is an extension of the temporary suspension of those requirements. Thus, if the agency takes no further action, the stopping distance requirements resume on January 1, 1977. The agency's favorable action on the September 1, 1977, date only means that the stopping distance requirements resume September 1, 1977. No regulatory action to modify the requirements themselves is contemplated, and therefore no "impact evaluation" of these requirements would be appropriate under the DOT policies cited by APTA.

Concern has been voiced that the agency set forth its rationale for specifying stopping distance requirements (including "no lockup" performance) in the case of buses. Several commenters appear to be under the impression that Standard No. 121 is directed solely to the elimination of jackknifing by truck-trailer combination vehicles. In fact the standard applies to air-braked straight trucks and buses because of the evidence that these vehicles are also involved in accidents due to vehicle instability and inadequate braking capabilities.

Jackknifing is only one severe result of the lateral instability caused by loss of traction due to locked wheels during braking. The same instability can also lead to sliding, "spin-out," and loss of steering capability in straight trucks and buses. The need for protection against such problems has been specifically addressed several times in earlier notices on the standard (e.g., 35 FR 10368, June 25, 1970; 39 FR 44480, December 24, 1974; 40 FR 24915, June 11, 1975; 41 FR 8783, March 1, 1976). Rockwell asked that further analysis be provided that would be directed specifically at the accident experience of buses. The company suggested NHTSA analysis of the recent Bureau of Motor Carrier Safety Report on "1973/74 Accidents of Motor Carriers of Passengers" and the data supporting the report. That report has been reviewed by the NHTSA, along with the individual bus accidents reports for 1975.

The report itself (available in the NHTSA docket and from BMCS) emphasizes highway, driver, and time and place aspects of the accidents without detailing information that would indicate accident causation. The individual accident reports, however, contain more complete information. Review and tabulation of information contained in the written descriptions of accidents provides the following facts:

1. In the year 1975, 750 bus accidents resulting in fatality, injury or a minimum of $2,000 in property damage were reported to BMCS.

2. Of the total, 322 (43 percent) were described in a way that indicates that braking occurred prior to the accident. Sixty-eight (9.1 percent) of the accidents were explicitly described as involving skidding due to locked wheels during braking. The 68 skidding accidents resulted in 6 fatalities, 296 injuries, and an average of $5,213 property damage per accident.

3. No antilock-equipped bus was involved in any of these skidding accidents.

The NHTSA does not claim that all of these accidents would have been prevented if the buses had been equipped with antilock systems. The accident descriptions are not detailed enough to estimate the effect of "no lockup" capability. But the evidence demonstrates that skidding accidents are common for buses, and it is reasonable to assume that a significant portion of those accidents could have been prevented or lessened in severity by no-lockup braking capability.

Claims by transit bus operators that transit buses should be excluded from the "no lockup" requirement because of their low-speed urban operation are not substantiated by the BMCS data. Although most of the buses subject to BMCS regulation are of the intercity type, the accidents involving skidding are seldom high-speed accidents. For those cases in which vehicle speed prior to the accident was reported, it averaged only 36 mph. Furthermore, approximately half of the skidding accidents occurred in residential or business areas. These conditions are typical of transit bus operation, and the NHTSA concludes that transit buses should be subject to minimum requirements for lateral stability and service brake stopping capabilities.

The issue at hand is whether the existing suspension of certain of the standard's requirements should be extended to September 1, 1977, to permit the accumulation of more test data on the suitability of modified and new antilock systems designed for buses. As noted earlier, erratic behavior of previous bus antilock designs formed the basis for the existing suspension. Recently, a manufacturer of cab-chassis for school buses has also reported a safety-related defect installation in some school buses.

On May 12, 1976, Rockwell submitted to the agency a proposed test program for its bus antilock system. The program called for 39 intercity and 85 transit buses to be equipped with the modified Rockwell system. Rockwell estimated an accumulation of more than 9.6 million axle miles of service by August 1, 1976. By August 20, 1976, Rockwell had equipped 27 intercity and 37 transit buses with revised components for testing. The number of test vehicles is less than originally planned, partly because of lack of cooperation by operators and State inspection officials, and partly because of Rockwell's decision to withhold further installation of test units until the agency makes final the 8-month extension. By August 20, 27 inoperative occurrences had been reported in 1.4 million axle miles of transit bus operation. Rockwell did not report results of intercity bus operations, but Motor Coach Industries (a manufacturer of intercity buses) reported 16 inoperative occurrences in approximately 1.8 million axle miles of intercity service with the Rockwell system.

In its May 12 letter, Rockwell also announced a parallel experimental testing program for a new antilock system design. To date, only one of these units has been placed in transit system service, and it has accumulated over 20,000 miles without difficulty.

The AC Division of General Motors has also been testing an antilock system for buses. As of October 26, AC had installed its antilock system in 10 transit buses and 11 intercity buses. An additional 13 transit bus installations are planned in the near future. The transit buses range from zero to three months of service, with no problems encountered. Motor Coach Industries reported one inoperative occurrence in the six AC installations they have made, with an accumulated mileage of approximately 0.8 million axle miles. The other five AC-equipped intercity buses have experienced no problems after about one month of service.

AC Division indicated in its comments on the proposal that, barring any unforeseen difficulties, production AC antilock systems will be available for buses manufactured on and after January 1, 1977. As of the date of this notice, AC Division has not notified the NHTSA of the development of any "unforeseen difficulties." Based on this information and analysis of the reliability data furnished to date, the agency has decided to amend Standard No. 121 as proposed to extend the suspension of bus stopping distance requirements to September 1, 1977. The preliminary data indicate that a reliable antilock system will be available in time for reinstatement of the requirements, and a further delay is not contemplated.

An issue related to this decision on bus stopping distance requirements was raised in the comments to the proposal. Rohr Industries and International Harvester requested that the suspension of stopping distance (and "no lockup") requirements be made "retroactive" to buses manufactured since the effective date of Standard No. 121 but prior to the January 6, 1976, commencement of the suspension.

The statutory and regulatory scheme under which the standard was promulgated do not provide for such "retroactive" action. Section 108 (a)(1)(A) specifies that a vehicle shall comply with standards in effect on the date of its manufacture. Part 571 of NHTSA regulations also state: ". . . each standard set forth in [Part 571] applies according to its terms to all motor vehicle or items of motor vehicle equipment the manufacture of which is completed on or after the effective date of the standard" (49 CFR 571.7). In this case, antilock systems have been disconnected because of safety-related defects in their operation. Under § 154 of the Act, the vehicle manufacturer must provide an adequate repair of safety-related defects, unless replacement of the vehicle, or refund of the purchase price, is undertaken. "Adequate repair" is defined in § 159(4) not to include "any repair which results in substantially impaired operation of a motor vehicle or item or replacement." The permanent disconnection of an antilock system would be considered by the NHTSA to constitute substantial impairment of the motor vehicle. Of course, the vehicle owner is entitled to decline an offer of repair by the manufacturer.

In a matter unrelated to the proposal, the agency takes the opportunity to make several editorial changes to the text of Standard No. 121. A correction in S5.1.7 ("statically" in place of "statistically"), conformance of the auto-transporter effective date in S5.3 to the correct date in S3 (September 1, 1977), and deletion of an obsolete reference to S5.3.1.3 in S5.3.1 are all effectuated. Additionally, options that terminated in June and September 1976 are deleted to simplify the standard's text.

In accordance with Department of Transportation policy encouraging adequate analysis of the cost and other consequences of regulatory actions (41 FR 16200, April 16, 1976), the NHTSA has evaluated the economic and other consequences of this amendment on the public and private sectors, including possible loss of safety benefits. The agency estimates that there will be a cost to society due to the delay, because of the decreased stability of buses produced without "no lockup" capability. However, the potential for accidents due to possible malfunction of the new antilock components exists in the absence of the longer suspension. Also, there are costs associated with the increased maintenance that could result from reintroduction of antilock systems earlier than September 1, 1977.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended . . . .

Effective date: November 26, 1976.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 19, 1976.

John W. Snow
Administrator

41 F.R. 52055
November 26, 1976

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 12)

In response to two petitions for reconsideration of earlier rulemaking and to related requests, the NHTSA has extended for four months the existing suspension of the bus service brake stopping distance requirements contained in Standard No. 121, *Air Brake Systems*, along with an additional 3-month extension for school buses. A manufacturer of intercity buses and a manufacturer of school bus chassis petitioned to extend the suspension, which was scheduled to end September 1, 1977. The delay in reaching a decision on the petitions has made a short extension desirable.

Effective date: June 13, 1977.

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BACKGROUND

Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Following implementation of the requirements for buses, a pattern of erratic behavior developed in the performance of the antilock system used by manufacturers of transit and intercity buses to satisfy the "no lockup" requirements of the standard (S5.3.1). At an October 1975 public meeting the bus operators and manufacturers involved reviewed their experiences with implementation of the standard and expressed their views on potential safety hazards of antilock malfunction. Based on these and other reports, the NHTSA proposed a suspension of the service brake stopping distance requirements (including the "no lockup" requirement) to provide a period in which modified antilock hardware and newly introduced systems could be field-evaluated (40 FR 52856; November 13, 1975). The proposed suspension of 1 year until January 1, 1977, was made final January 6, 1976 (41 FR 1598; January 9, 1976). Several vehicle manufacturers and user groups argued that the suspension should be for a longer period and the suspension was subsequently extended from January 1, 1977, to September 1, 1977 (41 FR 52055; November 26, 1976).

PETITIONS AND REQUESTS FOR DELAY

Motor Coach Industries (MCI) and its parent company Greyhound Corporation have asked that the termination of the suspension for service brake requirements be delayed until January 1, 1979, in the case of intercity buses. The American Public Transit Association (APTA) also petitioned for the same delay in the case of both intercity and transit buses. The Chicago Transit Authority (CTA) recommended complete exclusion of transit buses from the standard, although the arguments in their letter only address the "no lockup" requirement, and the CTA may have meant to request exclusion from this requirement only.

Transit and intercity buses use a distinctive axle configuration, and only one supplier of antilock components for the axle exists. The supplier, AC Division of General Motors, has indicated its readiness to supply antilock components to transit and intercity bus manufacturers (and those school bus manufacturers that utilize the same distinctive axle).

International Harvester (IH) petitioned for reconsideration of the September 1977 termination date for stopping distance requirements in the case of air-braked school buses, arguing that reliability testing of new sensor and mounting components would require continuation of the suspension until mid-April 1978. IH had reported a safety-related defect in its school bus antilock system in July 1976 due to vibration-induced "false cycling" problems associated with the school bus duty cycle. While IH and its antilock supplier are not experiencing reliability problems with the new antilock component used on school bus chassis, the company wishes to accumulate at least 6 months of field evaluation before going into production. IH and Kelsey-Hayes (its antilock supplier) met with the NHTSA engineering staff on February 17, 1977, to provide information on the field evaluation. That meeting was followed by additional meetings and a detailed letter request to Kelsey-Hayes for further durability testing data.

This notice also responds to a recommendation on the bus suspension from the Truck and Bus Safety Subcommittees of the National Motor Vehicle Safety Advisory Council and the National Highway Safety Advisory Committee. These subcommittees were established by the Secretary of Transportation to provide recommendations on truck and bus safety. At the request of former NHTSA Administrator John Snow, the subcommittees convened in March 1977 to address the issue of Standard No. 121's implementation. From that meeting, the subcommittees recommended, among other things, continuation of the suspension of service brake requirements for buses until January 1, 1979. The American Trucking Association (ATA) has since petitioned the NHTSA to adopt this and related recommendations of the subcommittees.

EVALUATION OF THE PETITIONS

While most of the petitions, requests, and recommendations were not accompanied by supporting information, the MCI and IH petitions included data on reliability testing to support their requests. Data on the AC Division system used on intercity, transit, and some school buses was evaluated separately from the data on the Kelsey-Hayes system used by IH on its school bus chassis.

Intercity and Transit Buses. When the bus service brake stopping distance suspension was proposed in November 1975, AC Division indicated that it would enter the intercity and transit bus antilock market, and MCI agreed to have one of its intercity buses equipped with AC equipment. MCI equipped a second bus with AC equipment on an experimental basis and subsequently installed four more systems on a production line basis in 1976.

The 1-year suspension was made final in January 1976. In May 1976 the agency proposed continuation of the suspension to September 1977 "to have the experience of a full year of antilock operation in all environmental conditions, particularly in the winter season" and to permit reaching "a sound decision in time to permit orderly planning of bus production."

In making final the 8-month extension in November 1976 the agency noted AC Division's test experience with bus antilock systems (including data on MCI buses) and AC's position that it expected to have antilock ready as production hardware by January 1, 1977. The NHTSA therefore notified the public that "The preliminary data indicate that a reliable antilock system will be available in time for reinstatement of the requirements and a further delay is not contemplated" (41 FR 52057; November 26, 1976). In a February 1977 meeting with the NHTSA, AC Division indicated that it has production hardware ready on a 4-month leadtime basis, and that General Motors is prepared to equip its own production of intercity, transit, and school buses with its product starting September 1, 1977.

AC Division field-evaluated its system on GMC buses (both intercity and transit), on Flxible transit buses, on one Prevost intercity bus, and on MCI intercity buses. AC reported to the NHTSA on 34 installations, of which six were MCI buses. Data were reported on the MCI buses both for an early generation of components and for a later set. Second generation computers were supplied so that common computers with a new diagnostic feature could be used on trucks and buses. Prototypes of second generation sensors were provided to account for bus brake temperatures that are higher than those of trucks, and to prevent water intrusion in the new design.

In analyzing reported malfunctions on the MCI buses, the agency eliminated three "burned out" computer failures that occurred while the bus was in the shop and were caused by a mechanic's negligence that permitted a "severe load dump" to the electrical system. A malfunction caused by improper bearing adjustment was also eliminated. As of April 25, 1977, 5 malfunctions had occurred during 2.8 million axle miles of travel (187,000 vehicle miles per failure). The malfunctions were "fail safe" and all occurred before the corrections discussed above. Mileage since the corrections produced no malfunctions.

The AC Division bus antilock system is essentially the same as AC truck systems that have proved reliable in service since their introduction in early 1975. While the agency does not dispute MCI's view of what level of testing it considers appropriate, the NHTSA has confirmation by General Motors, as a manufacturer of both intercity and transit buses, that they are confident of the AC Division system and are prepared to place it on their vehicles.

At the same time, the second generation sensor is entering production at this time for installation on trucks, and production units will be available for further evaluation in the more demanding bus application. In view of this opportunity for evaluation of redesigned sensors built on production tooling, and in view of the agency's delay in responding to the petitions for reconsideration, it is concluded that a short continuation of the suspension until January 1, 1978, is justified. Accordingly, on reconsideration of the September 1, 1977, termination date established last November, the NHTSA hereby extends the suspension to January 1, 1978, for transit and intercity buses.

The CTA asked for total exclusion of transit buses from the standard but addressed only the issue of antilock system reliability. APTA petitioned for continuation of the suspension for both transit and intercity buses, although the association's arguments addressed only transit buses. APTA reviewed experience with the Rockwell system that had developed problems in early 121-equipped buses, cited the subcommittees' recommendation for further delay, and recommended the initiation of a 6-month 200-vehicle fleet test prior to implementing the service brake stopping distance requirements.

The NHTSA has analyzed the two petitions and does not believe that they provide additional information that would justify a delay beyond January 1, 1978, for these buses. The CTA did not provide data that would substantiate its assertions that radio frequency interference (RFI) is a problem, or that transit buses do not require "no lockup" performance. The NHTSA believes the references to RFI refer to the past system used on buses. AC Division has detailed the precautions it has taken against RFI, and it has had field experience with its system on trucks for more than 2 years. The safety need for "no lockup" performance on transit buses was discussed by the NHTSA in the November 1976 notice cited earlier, and the agency maintains its view of the desirability of this safety feature.

The majority of APTA's comment addressed the Rockwell system that is no longer in use. The only comment about the AC Division system pointed out the introduction of the second generation sensor in June 1977 and concluded that a 200-bus fleet test of the antilock components would be desirable. The NHTSA has explained above why it considers a 4-month delay adequate to be assured of reliability of this component. As to the size of the test fleet, it is the agency's view that the APTA membership could have tested 200 units on its transit bus fleets during the past 18 months if it had cared to. The agency is not aware of APTA objections to the size of the AC Division test effort at the time it was constituted as a 34-bus fleet.

School buses. In the case of air-braked school buses, a comparable situation has arisen to that of intercity and transit buses. Second generation componentry for IH buses has been introduced by Kelsey-Hayes, no reliability problems have been encountered, and the subcommittees also recommended continuation of the suspension. While the same considerations argue for a 4-month delay, the agency does not have as many miles of field data on the newly designed sensor and mounting bracket upon which to make a judgment of system reliability as it did in the case of the AC Division system and its new sensor. In addition, most school buses receive little or no use during the summer months. For this reason the NHTSA concludes that the full period of delay requested by IH in its petition for reconsideration should be allowed. In this period, approximately 100 new sensor installations will be monitored to provide full assurance of system reliability. Accordingly, 3 additional months of suspension have been provided in the case of school buses only.

TRUCK AND BUS SAFETY SUBCOMMITTEES

The NHTSA Administrator invited the subcommittee's Chairman to hear a presentation of NHTSA findings on the issue of continued suspension for buses. That invitation was expanded to include those members of the subcommittees that wished to accompany the Chairman to the April 22, 1977, briefing. Although not planned as a meeting of the subcommittees, a summary of the meeting has been prepared for submission to the public docket.

The subcommittees heard the agency's views and offered their own. The agency weighed the points made by the subcommittees in support of a delay until January 1, 1979, but concluded that adequate field-testing time would be available to make preparations for meeting the full requirements of Standard No. 121 by January 1, 1978, in the case of transit and intercity buses, and by April 1, 1978, in the case of school buses. The American Trucking Associations had petitioned the NHTSA to follow the subcommittees' recommendation of a January 1, 1979, effective date for buses and other enumerated vehicles. To the degree that this decision does not grant the American Trucking Associations' petition relative to buses, it is denied for the reasons set forth above. Other items in the ATA petition will be treated in subsequent notices.

At the meeting the agency expressed its view that it is incumbent on a manufacturer asking for more test time to explain why its test programs had not been enlarged to proportions that would give adequate assurance of reliability by the scheduled termination date. Opportunities to expand the test program in this case existed in November 1976 when the agency stated it contemplated no further delay and again in January 1977 when Rockwell withdrew as a supplier of antilock systems. The agency urged expansion of test programs when requests for further delay were received. Contacted about the size of its test fleet, MCI indicated that the test fleet was kept small in the first instance so that it could be carefully moniored to avoid accidents. Only after some confidence in the safety of the new components is accumulated will MCI expand its programs to a larger number of buses.

The agency knows that it cannot and should not design a manufacturer's test program. At the same time, the agency cannot be prevented from carrying out its safety mission simply by the decision of a manufacturer not to undertake design and testing of safety systems proposed by the agency. It is obvious from the legislative history of the National Traffic and Motor Vehicle Safety Act that Congress intended the manufacturers to be responsive to the agency's proposals for upgrading safety systems.

While the agency has not adopted completely the recommendation of the subcommittees in the case of buses, their recommendations have formed the basis of several significant actions by the Department of Transportation. Noteworthy in this regard is the decision by the Federal Highway Administration's Bureau of Motor Carrier Safety (BMCS) to commence "courtesy inspections" of 121-equipped vehicles later this year. In the near term, these courtesy inspections are for informational, educational, and training purposes, and are intended to form the basis for future BMCS compliance inspections.

In consideration of the foregoing, the phrase "Except for a bus manufactured before September 1, 1977" in S5.3.1 of Standard No. 121 (49 CFR 571.121) is amended to read "Except for a school bus manufactured before April 1, 1978, or any other type of bus manufactured before January 1, 1978."

The economic and inflationary impacts of this rulemaking have been evaluated in accordance with Office of Management and Budget Circular

A-107, and an Economic Impact Statement is not required.

Because the amendment delays requirements that would otherwise become effective and does not create additional obligations for any person, the agency finds that the amendment may become effective immediately.

The program official and lawyer principally responsible for this rulemaking are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 7, 1977.

Joan Claybrook
Administrator

42 F.R. 30188
June 13, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 15)

This amendment adds a small number of vehicles to the category of oversize and specialized vehicles that are permanently excluded from the applicability of Standard No. 121, *Air Brake Systems*, extends the existing temporary exclusion of heavy hauler trailers and auto transporters until January 1, 1979, and eliminates the "no lockup" requirement in the case of trailers designed exclusively for harvesting lumber or pulpwood, and in the case of inboard wheels on trailers with more than four wheels on an axle system. The amendment responds to manufacturer petitions for exclusion from some or all of the requirements of the standard because of the vehicles' distinctive configurations and functions.

Effective date: August 22, 1977.

Addresses: Petitions for reconsiderations should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Duane Perrin
Office of Crash Avoidance
National Highway Traffic Safety
Administration
Washington, D.C. 20590
(202–426–2153)

Supplementary Information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers, and has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Certain vehicles were excluded from the standard's applicability because their functions or construction dictate oversize or distinctive operational characteristics that result in restricted highway operation (e.g., low speed, permit requirements, daytime operation), which limits hazards and the possibility of accidents. Also their distinctive configurations and low production volumes increase compliance costs.

Because of unavailability of components and other constraints, certain other vehicle categories were excluded from all or some of the standard's requirements for a temporary period. The temporary exclusions that remain in effect are scheduled to end on September 1, 1977.

Several vehicle manufacturers and trade associations petitioned for extension of some of the temporary exclusions, or conversion of them into permanent exclusions. The Truck and Bus Safety Subcommittees of the National Motor Vehicle Safety Advisory Council and National Highway Safety Advisory Committee recommended to the Secretary of Transportation that particular vehicle types be granted full or partial exclusions from the standard.

Based on consideration of the petitions and on the recommendations of the Truck and Bus Safety Subcommittees, the NHTSA proposed several new permanent exclusions from the standard. The 108-inch-width exclusion was proposed for expansion to include vehicles with a width of more than 102 inches. In all states other than Hawaii, vehicles of this width are allowed on the highway only in permit operation. The agency finds that these vehicles are operated with the same level of care as vehicles of 108 inches in overall width. No adverse comment was received on the proposal and it is accordingly made final.

The agency proposed permanent exclusion of vehicles whose gross vehicle weight rating (GVWR) exceeds 120,000 pounds, under the assumption that such vehicles always operate under restrictions of state motor vehicle administrations. Comments were solicited on whether such vehicles exist that are not already excluded from the standard under another category, and whether such vehicles ever operate in unrestricted highway use. Fruehauf, Rogers Brothers, and Talbert Trailers pointed out that Michigan allows unrestricted highway operation of certain trailers in excess of 120,000 lbs. GVWR. These trailers may be flatbeds, tankers, or dump bodies with 8 or more axles and are currently being built to conform to the standard. Low bed heavy hauler trailers, on the other hand, must have their axles aft of the load, and do not have room for as many as eight axles without exceeding the state length limit requirements, and hence are still subject to restricted operation. It is apparent that the exclusion should be narrowed so that its language reaches only those vehicles originally intended for exclusion. It appears that only low bed "heavy hauler" trailers in this weight range fall under state operating restrictions. As made final, therefore, the exclusion is narrowed to cover only a trailer that has a GVWR of more than 120,000 pounds and a body that conforms to the height limitation for heavy hauler trailers of 40 inches. Fruehauf suggested a 44-inch deck height criterion, but offered no supporting information, and the NHTSA sees no reason to change from the 40 inches presently specified for heavy hauler trailers.

The third proposed permanent exclusion was for "load divider" dollies that are designed exclusively for use with the larger trailers that are already excluded from all the requirements of the standard. This addition was supported, but the Truck Trailer Manufacturers Association (TTMA) and others requested a correction in the description of the vehicle. The agency referred to the "fifth wheel plate" of the dolly which improperly described the connecting or mating devices employed. The proposal is made final, with an appropriately broader statement of vehicle description.

Several commenters argued for additional permanent exclusions from the standard. Schwartz Manufacturing Company asserted that the "heavy hauler" trailers that are currently excluded from the standard for a limited period should all be permanently excluded because of their off-highway use and their typical ownership by a small company with limited maintenance resources. The agency has proposed and is making final an extension of the existing temporary exclusion while it develops more data on the difficulty encountered by manufacturers in constructing these vehicles to comply with the standard. Information requests have been issued by the agency and replies have been received which are presently undergoing analysis. Until analysis is completed, it would be premature to act on the Schwartz request, and it is therefore declined.

Master Truck, the City of San Diego, and the Lake Disposal Corporation supported the Truck and Bus Safety Subcommittees' suggestion to exclude refuse trucks from Standard No. 121 entirely, or at least from the "no lockup" provision. The commenters pointed out that the duty cycle of these vehicles differs from that for highway tractor-trailer combinations and that much of the travel is at low speeds between pick-ups. The City of San Diego pointed out that it must purchase from the low bidder, which can result in having to service several of the commercially available antilock systems, thereby compounding maintenance problems. The agency does not dispute these points, but also does not view them as peculiar to the brake systems of these vehicles. Refuse collection and hauling presumably do put distinctive strains on a vehicle, and the problem of low-bid contracting does occur in municipal fleet maintenance. It is assumed that such problems with braking and other vehicle systems occurred prior to implementation of Standard No. 121 and that adaptive steps were taken to compensate for them. It is conceivable, in fact, that some of the adaptations (such as the use of longer wearing but less effective brake linings) may have reduced somewhat the braking capability of some refuse haulers in relation to vehicles of comparable size that serve other functions. It is the agency's considered judgment that the duty cycle of a particular vehicle type should not be fully determinative of its braking capability or general safety characteristics. For this reason, the agency declines to act on requests for exclusion of these vehicles but will continue to give consideration to this and other proposed adjustments in the standard's applicability.

Zieman Manufacturing Company asked that trailers with a GVWR of 10,000 pounds or less with air-over-hydraulic brakes be excluded from the standard's applicability. Such an exclusion was proposed in June 1975 (40 FR 24915, June 11, 1975) in response to the petition of Altec Industries. On the basis of comments received, particularly those of the California Highway Patrol, it was decided not to provide such an exclusion because of the potential for abuse of the category. The Zieman request is therefore not adopted.

No comment was received from any mobile crane manufacturer on the wisdom of continuing the present limits for these vehicles: exclusion of larger categories only, unless top speed is restricted to 45 mph. In the absence of comment, the agency has decided to leave the present exclusions affecting mobile cranes unchanged, except for the over 102-inch width exclusion previously discussed.

It is noted that the existing permanent exclusion of non-cargo-carrying trailers was inadvertently restated in the proposal in exactly the opposite form from that intended. The error is corrected in this amendment.

As a general matter, the continuation of temporary exclusions for heavy hauler trailers and auto transporters was supported. Little information was provided in the comments on the readiness of manufacturers to implement the standard by January 1, 1979. Information requests have been sent to the affected manufacturers to develop additional data. Freightliner Corporation, as the manufacturer of incomplete truck tractors for auto transporter combinations, argued for the indefinite exclusion of these combinations from the standard.

Freightliner's first argument was that the high center-of-gravity characteristics of the towing vehicle (car carired over the cab) and the unique load transfer characteristics of the articulation point on some auto transporters can produce effects which combine to offset the advantages of imposition of the standard on these vehicles. The agency understands that these factors can make compliance for auto transporters more difficult, and has acknowledged this fact by proposing an effective date for auto transporters that is four years after the initial effective date for other highway vehicles. However, the agency is also aware that auto transporters can be (and have been) built to comply fully with the present requirements of the standard. If Freightliner or any other interested party has data to show that the present requirements are insufficient to ensure a safe braking system for auto transporters, the agency solicits their suggestions for improvements.

As a practical matter, the agency has stated (May 5, 1975, NHTSA letter to E. Hammond, Trailmobile Tech. Center) that it will use the chassis manufacturer's load limitations, both weight and center-of-gravity, for purposes of determining compliance. Thus Freightliner's "envelope" of specifications in its incomplete vehicle document would be the outside limit for loading the completed tractor for compliance test purposes. The only limitation on this method would be an "envelope" of specifications so conservative that the braking characteristics of the vehicle as completed would constitute a safety-related defect.

The second point raised by Freightliner is that the testing procedures in the standard may need to be modified before tractors and trailers of the auto transporter combination can be tested separately. During the period of continued delay, the NHTSA intends to call a public meeting to discuss this problem with the affected chassis-cab manufacturers and the auto transporter industry. Freightliner's suggestion for indefinite delay appears unnecessary and, accordingly, is declined.

Freightliner's third argument was that, assuming that incompatibility between the tractor and trailer portions of an auto transporter is great, the agency should not require their compliance with the standard until all incompatibility is removed from all air-braked vehicle combinations subject to the standard. Actually, the compatibility problems between tractor and trailer are probably less in the case of auto transporters than other combinations because there is more pairing of tractors and trailers in this industry than in the case of dry freight vans. The NHTSA tests mentioned by Freightliner will be completed prior to the January 1, 1979, effective date for auto transporters.

PACCAR, Inc., and Mack Trucks, Inc., both commented favorably on the American Trucking Association's request to continue the exclusion of, vehicles equipped with an axle with a gross axle weight rating (GAWR) of 24,000 pounds or more. The agency did not propose continuation because no vehicle or axle manufacturer had petitioned for delay, and because there was strong evidence that the exclusion was being abused by manufacturers who would provide a highe-than-normal rating to avoid the requirements of the standard. PACCAR's expectation that few such vehicles are built because permits are required for loads of more than 24,000 pounds on an axle is not to the point. It is not the gross vehicle weight on the highway that is controlling here, but simply the capacity of the axle installed by the manufacturer. In other words, the vehicle could obtain complete exclusion by the installation of heavy axles, whether or not they are ever used on the highway at full capacity requiring permit operation.

Mack noted the many truck types (*e.g.*, cement mixers, dump trucks) whose permits, if any, do not closely control the actual operation of the vehcile. As a practical matter, these vehicles operate in unrestricted operation with extremely heavy, and often high center-of-gravity, loads that necessitate extremely good braking. The agency continues to believe that an exclusion at this GAWR level is unjustified. The 29,000-pound exclusion reflects the larger vehicles with truly distinctive configuration and more specialized operation that justify special treatment.

Mack, PACCAR, and the ATA also recommended extension of the exclusion for vehicles with two or more steerable axles with a GAWR of 16,000 pounds or more for each axle. No supporting data was presented and no other comments were received. In the absence of any supporting data the request is denied.

The partial exclusion from the "no lockup" requirement in the case of "wheels other than the outermost on an axle system with more than four wheels" was supported without comment and is therefore made final. Rogers Brothers suggested that use of "axle system" to describe the row of wheels across the vehicle could be misleading. The agency's use of the term as part of its certification requirement to state "axle system" GAWR has not proved troublesome. On the basis of this experience, the terminology is made final as proposed.

The TTMA suggested that the exclusion of certain logging and pulpwood trailers from the "no lockup" requirement be expanded to permit them the same parking brake option as is provided to agricultural commodity trailers. While not within the scope of this notice, the agency will consider this suggestion in its next parking brake proposal.

While the Truck and Bus Safety Subcommittees did not take a position on the proposal, it is noted that their June 23, 1977, letter to Secretary Adams reaffirmed their eariler recommendations for revision of Standard No. 121.

The economic impact of this rule has been considered and has been determined to be minimal. This is due primarily to the low production volume both collectively and by individual firms and the brief leadtime remaining to make considerable design changes. This could even cause substantial adverse economic and financial impacts if these manufacturers were forced to comply by the September 1, 1977, effective date. However, it has also been determined that the additional leadtime provided by this Final Rule should be sufficient to modify production lines which would incorporate the necessary design changes to accommodate the FMVSS 121 hardware.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

Effective date finding. Because these amendments relieve a restriction and do not create additional responsibilities for any person, it is found that an immediate effective date that advises manufacturers of the new requirements as soon as possible is in the public interest.

The program official and lawyer principally responsible for this rulemaking document are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50)

Issued on August 16, 1977.

Howard Dugoff
Acting Administrator

42 F.R. 42208
August 22, 1977

PREAMBLE TO AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 14)

The amendment extends indefinitely an existing option for specialized agricultural trailers under Standard No. 121, *Air Brake Systems*, of meeting the parking brake requirements of the standard or the air-actuated "breakaway" requirements of the Bureau of Motor Carrier Safety. The option exists because the working environment of the trailers can lead to disabling of the parking brakes, and a solution to the underlying technical problems has not been perfected.

Date: Effective date June 27, 1977.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For Further Information Contact:
Scott Shadle
Office of Crash Avoidance
National Highway Traffic Safety Administration
Washington, D.C. 20590 (202) 426–0852

Supplementary Information: Standard No. 121 (49 CFR 571.121) permitted some bulk agricultural commodity trailers the option, until June 30, 1977, of meeting the parking brake requirements of the standard (actuation by an energy source unaffected by air loss in the service brake system) (S5.6.3) or the air-actuated "breakaway" system that complies with Bureau of Motor Carrier Safety (BMCS) requirements (49 CFR 393.43). Most manufacturers use the stored energy of a compressed spring to apply and maintain the required braking force required by S5.6.3.

Manufacturers petitioned for modification of this parking brake requirement in the case of some agricultural trailers because they often are dropped off near the fields by highway tractors and then towed into the fields by farm tractors. The farm tractors do not have air compressors to recharge the air supply and release the brakes in order to move the vehicles. When the spring brakes are mechanically released to allow movement they may not be re-engaged for highway operation, permitting the trailer to operate on the highway without a secondary means of braking. To avoid the hazard of on-highway operation with disengaged spring brakes, the agency adopted the option for a limited period.

Wesco Truck and Trailer Sales petitioned for extension of the option to December 31, 1978, and Utility Trailer Manufacturing Company petitioned for its indefinite continuation. The agency has an outstanding proposal to broaden the available means to meet the parking and emergency brake requirements for all trailers (40 FR 56920; December 5, 1975). However, because of the comprehensive nature of the proposed revision, it will not be acted on in the immediate future.

Until the broad proposal is made final or until another solution is available, the agency decided that the exclusion for these specialized trailers from the parking and emergency braking requirement should continue, as long as the vehicles are manufactured to comply with the BMCS requirements noted earlier. Accordingly, the agency proposed that the temporary exclusion contained in S5.6 and S5.8 of the standard be made permanent.

All comments received on the proposal supported continuation of the option. In the absence of a satisfactory solution to the underlying technical problems, the agency has decided to make final the changes as proposed.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended. . . .

The economic and inflationary impacts of this rulemaking have been evaluated in accordance with OMB Circular A-107, and an Economic Impact Statement is not required.

The agency finds that this amendment may become effective immediately, because the continuation of the option relieves a restriction.

The program official and lawyer principally responsible for the development of this amendment are Scott Shadle and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 27, 1977.

Joan Claybrook
Administrator
42 FR 33293
June 30, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

(Docket No. 75-16; Notice 18)

This amendment suspends the school bus service brake stopping distance requirements of Standard No. 121, Air Brake Systems, which were scheduled for reimplementation April 1, 1978. This action is taken to preserve the status quo of the standard's applicability while more far-reaching issues of the air brake standard are resolved by the Department.

Dates: The amendment is effective March 23, 1978. Petitions for reconsideration must be received no later than April 24, 1978.

For further information contact:

Mr. Duane Perrin, Crash Avoidance Division, Office of Vehicle Safety Standards, 400 Seventh Street, SW., Washington, D.C. 20590 (202-426-2153).

Supplementary information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Following implementation of the requirements for buses, a pattern of erratic behavior developed in the performance of the antilock system used by manufacturers of transit and intercity buses to satisfy the "no lockup" requirements of the standard (S5.3.1). The NHTSA suspended the service brake stopping distance requirement (including the "no lockup" requirement) for all buses to provide a period in which modified antilock hardware and newly-introduced systems could be field-evaluated (41 F.R. 1598; January 9, 1976). Several vehicle manufacturers and user groups argued that the suspension should be for a longer period and the suspension was extended from January 1, 1977, to September 1, 1977 (41 F.R. 52055; November 26, 1976), and subsequently to January 1, 1978 (42 F.R. 30188; June 13, 1977), with an additional 3-month delay for school buses.

The suspension of requirements for school buses is therefore scheduled to end April 1, 1978. While no school bus chassis or final-stage manufacturer has petitioned for further delay of the "no lockup" requirement, two petitions for the exclusion of school buses from this requirement have been submitted by the users of school buses. The National Association for Pupil Transportation petitioned for permanent exclusion of school buses on several grounds, including assertions about the unreliability, high costs, and difficulty of maintaining antilock systems.

A second petition was recently filed jointly by the Transportation Director's Association of the State of Georgia, the County Superintendents of the State of Georgia, and the State Specification Committee of the State of Georgia. This petition requests exclusion of school buses from the entire standard, although the arguments for exclusion relate mainly to antilock system difficulties.

Much of the information in both petitions appears to be based on experience with systems manufactured during the first months of the standard's implementation, and does not take into account improvements and other changes in circumstances since the bus service brake stopping distances were suspended in January 1976. Most notably, the extension of stopping distance requirements in March 1976 (41 F.R. 8783; March 1, 1976) permits most school buses to be certified to S5.3.1 of the standard without the installation of antilock systems. Current manufacturer plans are for antilock to be standard equipment on about 18 percent of all school buses after the scheduled reimplementation of service brake stopping distance requirements. Approximately 85 percent of these buses would have antilock only on the rear axle.

The Department has initiated a series of actions that are intended to resolve major concerns that have been raised with regard to the reliability, effectiveness, and costs of the antilock systems generally used to meet the standard (42 F.R. 9626; March 9, 1978). Given this initiative, it appears inappropriate to change the status quo as it affects the manufacturer of vehicles not presently required to meet the stopping distance and "no lockup" requirements of S5.3.1. While there appears to be no independent basis in data or individual experience to indicate that the requirements should not be reimplemented for school buses at this point, manufacturers that otherwise support the standard have counseled maintenance of the status quo for school buses while the other more major issues are resolved. This point was made in December 1977 by Ford as a major supplier of school bus chassis and by Bendix, a manufacturer of antilock systems.

The NHTSA has therefore decided to temporarily postpone reimplementation of the service brake stopping distance requirements of Standard No. 121 as they apply to air-braked school buses. The NHTSA solicits comment on the reestablishment of these requirements at a certain date and on what that date should be. The Motor Vehicle and Schoolbus Safety Amendments of 1974 (Pub. L. 93–492, October 27, 1974) and mail regularly received by the agency make clear that the public and their legislators advocate strong regulation of the safety systems on school buses.

In accordance with Departmental procedures, the economic and other consequences of this rulemaking have been evaluated. As the rule maintains the status quo, it is not expected to have any new effects other than the inventory losses for the several school bus chassis manufacturers which do not also build trucks. These inventories could be utilized in response to purchase of antilock systems on an optional basis.

In an unrelated matter, the agency takes this opportunity to delete S3.1.2 and the reference to it in S3.1, because it was a temporary provision of the standard that is no longer effective.

Effective date finding: It is found that notice and public comment on this amendment are impracticable because of the extremely short time remaining before the requirement in question would otherwise become effective (April 1, 1978). Furthermore, it is found that the amendment may take effect sooner than 30 days following the date of its publication in the Federal Register because it relieves a restriction.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended as follows. . . .

The program official and lawyer principally responsible for this document are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegations of authority at 49 CFR 1.50 and 501.8.)

Issued on March 20, 1978.

Howard Dugoff
Acting Administrator

43 F.R. 12015
March 23, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 21)

This notice fulfills the remand of the Ninth Circuit Court of Appeals in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation* with regard to modification of test procedures, which is the only aspect of the order not subject to further judicial review. Test procedures and conditions are specified for frictional characteristics of the test track surface, duration of time intervals between road tests, duration of permissible wheel lockup during road tests, and the amount of curving in the test track. The agency also makes final a long-standing proposal to modify the means for establishing the frictional resistance of the road test surface.

Dates: The amendment is effective August 25, 1978. Petitions for reconsideration must be received no later than October 5, 1978.

Address: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, 400 Seventh Street, S.W., Washington, D.C. 20590.

For further information contact:

Tad Herlihy, Office of Chief Counsel; National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–9511).

Supplementary information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Requirements are established for the service, emergency, and parking brake systems, including a requirement that the service brakes provide retardation, power and recovery capabilities. Road test procedures are set forth to advise manufacturers how the NHTSA will conduct its compliance tests of the manufacturers' products.

In January 1975, a truck manufacturer petitioned for judicial review of the standard's promulgation in accordance with § 105 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1394). The petitioner was subsequently joined by a trade association of truck users and a trade association representing the small manufacturers that complete trucks by mounting the bodies on incomplete truck chassis. The three actions were consolidated for argument in the Ninth Circuit U.S. Court of Appeals.

The Ninth Circuit recently entered its order on the petition for review and remanded the standard to the agency for further proceedings (573 F.2d 632). The Federal government has since petitioned for review of two aspects of that order in the Supreme Court. The purpose of this notice is to set forth the agency's actions in fulfillment of the third aspect of the remand, which was not a subject of the government's petition.

The court remanded several issues to the agency concerning the standard's test procedures, all of which are easily resolved by modifications in the standard's wording which do not affect the requirements for any person. The court stated that "the manufacturers are entitled to formal and reasonably specific testing criteria" in the area of frictional characteristics of the test track surface, duration of time intervals between repetitive road tests, duration of permissible wheel lockup during stopping distance tests, and the amount of curving in the test track.

Interpretation must be made of the court's remand on frictional characteristics of the test track. A first reading of the decision might suggest that a measurement technique (in the case, the "skid number" method of measuring road surface friction) may not be used in standards setting if it does not produce exact measurements. It is acknowledged that the skid number measurement has an accuracy tolerance, and that the tolerance can vary from measurement to measurement for a variety of reasons.

The agency does not believe the court intended this literal a reading, because no measurement can be exact as a matter of physical science. This exaggerated a reading of the decision would preclude all motor vehicle safety regulations, because all regulation involves measurement criteria and none is perfect. The agency's view is that the court objected only to reliance on a measurement technique that varies too widely in response to road surface conditions and that specified use of a no-longer-manufactured tire.

Because the tire specified is no longer manufactured, the NHTSA has already replaced the skid number measurement in all of its stopping distance standards other than 121. The only reason the technique was not replaced in Standard No. 121 was to comply with the Ninth Circuit's wish that the standard change as little as possible. (41 F.R. 24592; June 17, 1976). Now that review of the standard by the Ninth Circuit is complete, the agency can and does make final its longstanding proposal to use the new measuring technique. Comments received with regard to Standard No. 121 were discussed in conjunction with the June 1976 amendment.

The court also stated that the margin of variation in the measuring technique would not permit a manufacturer to conduct its tests by a means that ensured its vehicles would meet the requirement set forth in the standard. While the agency has always taken the position that an exact value (such as "skid number 75") is the clear and unambiguous way to state a legal requirement so that manufacturers are best on notice of what performance is required (e.g., 40 F.R. 47141; October 8, 1975), the agency can instead state a range of skid numbers in such a way that the manufacturer will be able to test to the exact skid number encountered in its testing, knowing that its vehicle has complied with the standard so long as the number used falls within the specified range. Essentially, the test procedure can be restated as a range (representing the anticipated tolerance in the new measuring method) in which the manufacturer has its choice of what skid number it uses. As long as this range includes the criterion specified in the past by the NHTSA and is already being met by manufacturers, it is no more stringent that the past requirement. Similarly, the other skid numbers from which manufacturers could choose would fall in the range of those that they have been using previously, but without the certainty that the chosen number will be the one by which their vehicles are measured. This approach recognizes the physical impossibility of finding any measuring technique which is exact, and the agency finds that it accurately fulfills the court's remand. The skid number ranges established are from 20 to 30 for the wet surface, and from 71 to 81 for the dry surface, to reflect the different values obtained when the new test tires are used. It is noted that this revised specification of skid numbers is no more severe a requirement than the single values previously referenced in the standard.

As for the remaining test conditions which the court questioned, the agency has monitored these conditions as a part of its compliance program and the development of its compliance test procedures. It is apparent that manufacturers, permitted to choose reasonable values for these aspects of the test protocol in the absence of criteria set forth in the standard, have chosen values that fall within an easily adoptable level. No manufacturer, for example, has chosen to test on other than a straight test track, which is sensible in view of the fact that a straight track offers the easiest means of staying within a 12-foot-wide lane. Comparably, no antilock manufacturer has chosen other than reasonable "wheel lockup" times for its antilock systems because overly long lockups significantly and adversely reduce the stopping performance of the brakes on the controlled axle, which would sacrifice the other major characteristics of the vehicle being measured—that is, stopping distance. As for the interval between dynamic tests of the vehicle, the relevant factor is the relationship between the time interval and brake temperature, because a short interval could result in an adverse effect on braking capabilities due to fade or other thermal effects. Therefore, the NHTSA hereby adopts a specification for initial brake temperature, which will in turn determine the interval between tests. A review of NHTSA compliance test results has shown that the performance of all complying vehicles tested to date has been within the requirements specified in this amendment. Adoption of these values therefore does not adversely affect any person subject to the standard, and they can be incorporated for the benefit of remand without the delay occasioned by notice and opportunity for comment.

The decision to revise the standard in this fashion has been evaluated in accordance with the requirements of Executive Order 12044 (43 F.R. 12660; March 24, 1978) and the corresponding review procedures within the Department of Transportation (43 F.R. 9582; March 8, 1978). It has been determined that this rulemaking is governed by short-term judicial considerations and that, despite its connection with Standard No. 121, does not qualify as a rulemaking that raises issues of cost or controversy necessitating the level of review and comment contemplated by the two directives.

Effective date: With regard to the establishment of a new test tire for pavement resistance measurement, because the older test tire is no longer manufactured, and because the amendment of the procedure and test tire is intended only to duplicate the existing procedure and tire, this amendment creates no additional requirements for any person, and an immediate effective date is found to be in the public interest.

With regard to the modification of test procedures and conditions not based on a proposal, the agency finds that they do not impose additional requirements on any person, and that delay of a proposal is unnecessary and would be contrary to the public interest in responding to the court's remand as expeditiously as possible.

In consideration of the foregoing, Standard No. 121 is amended. . . .

The program official and lawyer principally responsible for this document are Duane Perrin and Tad Herlihy, respectively.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 25, 1978.

Joan Claybrook
Administrator

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75-16; Notice 24)

Action: Final rule and interpretation of court decision.

Summary: The U.S. Court of Appeals decision in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation* invalidated aspects of Standard No. 121, Air Brake Systems. This notice advises interested persons of the agency's interpretation of the *PACCAR* holdings, to guide continuing compliance with the standard. This notice also amends the standard as specified by the court to provide for "due care" certification.

Effective date: October 13, 1978.

For further information contact:

Tad Herlihy, Office of Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, B.W., Washington, D.C. 20590 202–426–9511.

Supplementary information:

Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Requirements are established for the service, emergency, and parking brake systems of these vehicles. Truck braking systems are a particularly critical safety system, due to large variations between the unloaded and loaded weight conditions and the generally higher weight of trucks compared to other vehicles on the highway. Major requirements of the standard are that vehicles stop in specified distances and that the wheels not lock uncontrollably during these stops. The "no lockup" requirement ensures that skidding due to wheel lockup and loss of lateral stability is minimized.

In January 1975 a truck manufacturer petitioned for judicial review of the standard's promulgation in accordance with § 105 of the National Traffic and Motor Vehicle Safety Act (the Vehicle Safety Act) (15 U.S.C. § 1394) under which the standard was issued. Petitioner PACCAR was subsequently joined by a trade association of truck users and a trade association representing the small manufacturers that complete trucks by mounting a body of specialized equipment on incomplete truck chassis. The three cases were consolidated for argument in the Ninth Circuit U.S. Court of Appeals.

The court's decision was issued in April 1978 (573 F2d 632, 9th Cir. 1978, Cert. denied October 2, 1978), and the mandate making it effective was entered October 11, 1978. Certain aspects of the standard were invalidated, and the purpose of this notice is to set forth the agency's interpretation of the court's specified holdings to guide continuing compliance with the standard. One of the court's three holdings, that concerning test procedures and conditions, has already been responded to by the agency (43 FR 39390; September 5, 1978).

Invalidation of Certain Stopping Distances

While expressing support for requirements that "decreas[e] the disparity of stopping distances between ordinary automobiles and heavier vehicles" and maintain "vehicle stability and directional control," the court was concerned about the safety of "heavier axles" in combination with the antilock systems used generally to provide "no lockup" performance. The court was concerned that a malfunctioning antilock system would allow wheel lockup of more aggressive front axle brakes more often or sooner than had been the case with weaker brakes, resulting in loss of steering control. The court's emphasis on the combination of aggressive front axle brakes and antilock is clear in the opinion:

> As new components—strong front axles, new brake linings, and mini-computers to control wheel lock and skid—were mass-produced, and subsequently *put together in a unique combination,* grave problems developed (emphasis supplied) 573 F2d at 641.

In referring to "heavier axles", the court was describing the brake retardation levels supplied by manufacturers to obtain the 258-foot (and subsequent 277-foot) 60-mph stopping distances specified by the standard prior to February 26, 1976. The 60-mph stopping distances were extended to 293 feet on that date (41 FR 8783; March 1, 1976) and have resulted in significant reduction in retardation force levels. The court did not take this change into account, because the Record filed with the court and the July 1976 oral argument contained no information about the performance of the vehicles built after February 26th to conform to the 293-foot distance. The agency received no petitions for reconsideration of the brake force levels established by the March 1976 notice.

The court held, with regard to stopping distances,

> . . . those parts of the Standard requiring heavier axles and the antilock device should be suspended. The evidence indicates that this can be accomplished if we hold, as we do, that the stopping distance requirements from 60 mph are invalid . . . We hold only that more probative and convincing data evidencing the reliability and safety of vehicles that are equipped with antilock and in use must be available before the agency can enforce a standard requiring its installation. 573 F2d at 643.

These two statements of the holding differ from one another, the first specifying both "heavier axles" and "the antilock device" for invalidation, while the second only specifies antilock. The text of the opinion (located at footnote 26) indicates that the court actually equates "stopping distance" with "the antilock requirement." The agency concludes that the court intended to invalidate "the stopping distance requirements from 60 mph" only insofar as a combination of high retardation force levels and a malfunctioning antilock would cause stability problems beyond those in vehicles built before the standard's effective date. At the same time the court was clear that the "no lockup" requirements were invalidated for both trucks and trailers.

It is therefore the agency's view that the "no lockup" portions of S5.3.1 and S5.3.2 insofar as they apply to trucks and trailers are invalid, along with the related stopping distances of 293 feet for service brake capability and 613 for emergency brake capability (720 for truck-tractors in the unloaded condition) established for 60-mph loaded and unloaded stopping tests under S5.3.1 and S5.7 for trucks. For those trucks with a speed attainable in 2 miles of less than 60 mph, the agency believes that the "top speed" stopping distance specified by S5.3.1.1 for both service brake and emergency brake stopping tests are invalid.

The agency does not believe that any requirements of Standard No. 121 are invalidated for buses because of the court's statement in footnote 1 that "[t]he part of the Standard that regulates air-braked buses is not at issue here." It is clear that the court was aware of the experience of buses built to conform to the standard, as evidenced by the court's reliance on statements by bus operators (footnote 43) and discussion of the rulemaking history for buses (text following footnote 25). The court's explicit removal of bus requirements from its consideration seems a clear intent to limit the ambit of its decision to trucks and trailers.

The agency concludes that only the actual stopping distances from 60-mph (or top speed) are invalidated and not other requirements that bear on performance of the vehicle. This understanding of the court decision fulfills the court holding cited above, while it does not disturb braking characteristics which do not present potential adverse handling characteristics. Thus, the stopping test sequence in which the truck or trailer must remain within a 12-foot lane from 60 mph (or top speed) is not invalid, while the requirement to stop within a specified distance is invalid.

The dynamometer requirements of S5.4 for trucks and trailers also were not affected by the court's holding. It does appear that the requirement for 90 p.s.i. air pressure in the trailer control line during the stop constitutes a portion of the "no lockup" requirement and is therefore invalidated by the court. Collateral requirements such as air reservoir volume that may be indirectly based on "no lockup" performance are not affected by the court decision.

A secondary reason to conclude that the testing from 60 mph remains in the test sequence is that manufacturers must continue to certify compliance with 20-mph stops and x parking brake test following certain 60-mph stops. The 60-mph stops affect the brake linings and could affect results of other portions of the testing if they are dropped from the test sequence.

With regard to the invalidated portions of the standard, the agency expects to publish a *Federal Register* notice shortly that sets forth its plans.

"Due Care" Certification

The court expressed concern about the certification responsibilities of the "final stage" manufacturers that mount the body or specialized equipment on mass-produced truck chassis built by other manufacturers. Section 114 of the Vehicle Safety Act (15 U.S.C. § 1403) specifies that the manufacturer or distributor of a motor vehicle shall certify that its product conforms to all applicable Federal motor vehicle safety standards. The agency has issued regulations that divide the responsibility for certification of "multistage" vehicles among the "incomplete vehicle manufacturers" of the chassis, any "intermediate stage" manufacturer involved, and the "final stage" manufacturer that completes the vehicle (49 CFR Parts 567, 568).

Standard No. 121 sets forth performance requirements that air-braked vehicles must conform to, and further sets forth the testing conditions under which the performance must be met (paragraph S6, *Conditions*). The requirements include a specification that certain stopping and wheel control capabilities be available under certain conditions, including stops from 60-mph and 20-mph in the unloaded and loaded conditions. The standard does not require that manufacturers subject their vehicles to these stops. It is accepted that the smaller final-stage manufacturers may not in all cases have the resources and capabilities to conduct such testing. The agency has regularly stated that a manufacturer may meet its statutory certification requirements either through demonstration of the specified stops or by any other chosen means that fulfills the related statutory requirement that a manufacturer must exercise "due care" in certification (15 U.S.C. § 1397(b)(2)). The agency has not stated to any final-stage manufacturer what its "due care" responsibility might consist of, in recognition of the reality that "due care" is essentially a judicial concept that is determined on a case-by-case basis in light of the factual situation facing the particular manufacturer at the time of certification. Because the engineering and financial resources available to a particular manufacturer are not fixed, what constitutes "due care" would vary among manufacturers, and even vary from day-to-day for the same manufacturer, making such a statement by the agency impracticable.

The court was sympathetic to the situation of the smaller final-stage manufacturer in holding that—

> . . . Since NHTSA has admitted that road testing is beyond the practical and financial reach of the final stage manufacturers, it must propose some alternative method for those manufacturers which, if followed, it will recognize as fulfilling the due care requirement. 573 F2d at 645.

Fortunately, an alternative to road testing does exist that would constitute "due care" in certification by any final-stage manufacturer that adopted it, whatever its resources and engineering expertise. Parts 567 and 568 obligate the incomplete vehicle manufacturer to provide a basis for complete certification (the "incomplete vehicle document") with each vehicle, which can be used for certification as long as the final-stage manufacturer does not violate an "envelope" of conditions listed in the document as the reasonable limits to which the incomplete vehicle manufacturer has already tested. A final-stage manufacturer can avoid any road testing simply by a "pass through" of this incomplete vehicle document. Of course, it would be a logical impossibility for the agency to specify what constitutes "due care" for the infinite number of configurations that exceed the "envelope" of conditions in advance of the manufacturer's decision to do so.

The problem, as noted by the court, is that the final-stage manufacturer only had assurances from the agency in the past that conformity to the incomplete vehicle document would constitute the exercise of due care in complying with Standard No. 121. What is required by the court's holding, in the agency's view, is the modification of Standard No. 121 itself to state a certification of compliance based on adherence to the incomplete vehicle document would constitute the exercise of due care. This is accomplished by this notice.

It is recognized that trailers and buses other than school buses are typically manufactured in one stage and this alternative method is unavailable to these vehicles. However, the court's holding discusses only the obligations of final-stage manufacturers that, by definition, only exist in the case of multistage manufacture.

In accordance with Department of Transportation policy for the analysis of regulatory actions, it is found that the amendment concerning due care does not constitute a significant regulation that requires regulatory analysis. Evaluation of the change indicates that it will have no economic effects other than a potential reduction of certification costs for some final-stage manufacturers.

Findings. Because the amendment constitutes an alternative method of compliance and creates additional requirements for no person, it is found for good cause shown that notice and opportunity for comment are unnecessary and that an effective date sooner than 30 days from the date of publication is in the public interest. The court's holding with regard to "no lockup" and stopping distances take effect independently of administrative action by the agency.

In consideration of the foregoing, paragraph S6 of Standard No. 121 (49 CFR 571.121) is amended by the addition of a sentence at the end of the text to read as follows:

"Compliance of vehicles manufactured in two or more stages may, at the option of the final-stage manufacturer, be demonstrated to comply with this standard by adherence to the instructions of the incomplete vehicle manufacturer and any intermediate-stage manufacturer provided with the vehicle in accordance with § 568.4(a)(7)(ii) and § 568.5 of Title 49, Code of Federal Regulations."

The program official and lawyer principally responsible for the development of this document are Duane Perrin and Tad Herlihy, respectively.

Issued on October 13, 1978.

Joan Claybrook
Administrator
43 F.R. 48646
October 19, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75-16; Notice 25)

Action: Final rule.

Summary: This notice amends the air brake standard to further extend existing exclusions for heavy hauler trailers, auto transporters, and other specialized vehicles from certain requirements and withdraws two recent changes in road test procedures. These actions follow judicial review of the standard, and are intended to provide direction with regard to the future of the air brake standard.

Dates: Effective date of amendments is December 18, 1978.

Addresses: Petitions for reconsideration should refer to the docket number and be submitted to: Room 5108, Nassif Building, 400 Seventh Street, S.W., Washington, D.C. 20590.

For Further Information Contact:

Mr. Duane Perrin, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202) 426-2153.

Supplementary Information: Standard No. 121, Air Brake Systems (49 CFR 571.121); regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. Requirements are established for the service, emergency, and parking brake systems of these vehicles.

Test Procedures

Certain aspects of the air brake standard were invalidated by court action in *PACCAR v. National Highway Traffic Safety Administration and Department of Transportation,* 573 F2d. 632 (9th Cir. 1978), *cert.* denied ________ U.S. ________ (October 2, 1978) (47 U.S.L.W. 3190 (Sup. Ct.)) as detailed in a recent agency notice (43 FR 48646; October 19, 1978). The agency fulfilled the court's remand with regard to modification of test procedures on August 25, 1978 (43 FR 39390; September 5, 1978), by means of several amendments. Notice and opportunity for comment were not provided, because the NHTSA judged that the modifications would not involve additional requirements for any person and reinstitution of the test procedures was found to be in the public interest. However, six petitions for reconsideration of some of the modifications have been filed by parties that argued the changes may or do in fact cause some changes in the standard's requirements.

In response to the court's order for a specific criterion for the interval between repetitive tests, the standard was amended to specify initial brake temperatures prior to the tests. Brake temperatures are partly a function of the time that brakes have to cool between tests.

Freightliner Corporation objected to the specification of a 150° to 200°F. initial brake temperature for stopping tests as the agency's method of establishing the test intervals. Freightliner explained that some of its brake designs could not provide the required 60-mph stopping distances if initial brake temperatures were above 180°F. The other commenters, in contrast, pointed out that metallic linings and disc brake technology argued for a higher initial brake temperature in some cases. The American Trucking Associations (ATA) suggested specification of a time period between repetitive tests as a means of fulfilling the court remand for test intervals.

In view of these possible substantive changes represented by the specification of an interval between repetitive road tests, the agency concludes that the wisest course of action would be to revoke the initial brake temperature specification and propose a new method, following consideration of the data and suggestions supplied by manufacturers. Withdrawal of the test interval specification is accomplished in this notice.

All petitioners requested that the modification of skid number specification be reconsidered. The agency met the court's objection to specification of a single value for the "skid resistance" characteristics of the test track by substitution of a range of permissible values. Commenters differed significantly with the agency both over the meaning of the court's opinion and the consequence of the modification adopted by NHTSA. Although the NHTSA does not believe that its modification had a substantive effect on the requirements of the standard, it is clear that there is a difference of opinion about the court's holding, and the NHTSA again considers the wisest course of action to be revocation of the skid number range to permit a proposal and opportunity for comment. The substitution of the updated and uncontroversial ASTM test method and tire is not revoked.

No other aspect of the test procedure modifications was cited by commenters as a source of specific concern.

As for the period of time that the skid number range and initial brake temperature requirements were in effect (from August 25th to the date of publication of this notice), the agency hereby states that it will not pursue cases that arose as a consequence of these requirements during the short period that they were effective.

Vehicle Exclusions

Auto transporters and heavy hauler trailers have been excluded from Standard No. 121 until January 1, 1979, due to the distinctive construction or use of these vehicles that make compliance with certain aspects of the standard more difficult. Four years of additional time were granted to manufacturers of these vehicles in order for them to work out solutions to their distinctive equipment problems. The Truck Trailer Manufacturers Association (TTMA) recently petitioned the NHTSA for permanent exclusion of heavy hauler trailers from the standard, based on hardware problems and related reasons.

The NHTSA proposed some continued exclusions for these and related vehicle types (43 FR 41056; September 14, 1978). The nature of the proposed exclusions was based on equipment space considerations, rough terrain use of some of the vehicles, and most importantly, on the uncertainty over future road testing requirements created by pendency of the Ninth Circuit litigation. It was accordingly proposed that heavy hauler trailers and auto transporters be temporarily excluded from stopping distance requirements, including the "no lockup" and related reservoir size requirements. Also, heavy haulers, pulpwood trailers, and straddle trailers would be permitted the same option as agriculture trailers and converter dollies have to meet only the emergency breakaway requirements and no parking brake requirements.

The proposed temporary exclusions from the road test and reservoir volume requirements were supported by Freightliner and General Motors, manufacturers of tractors for auto transporter use, and by Delavan Industries, Inc., an auto transporter manufacturer. The California Highway Patrol (CHP) and Wagner Electric Co., a brake component manufacturer, expressed concern that the exclusions not be made permanent, and that these vehicles eventually be required to exhibit the same performance as other air-braked trucks and trailers. No date for compliance was suggested. TTMA requested a review of the reservoir volume requirements for all vehicles in light of the *PACCAR* decision, and suggested a reduced volume requirement for trailers. No other comments on these subjects were received.

This amendment makes final the temporary exclusions from road test and reservoir volume requirements for heavy hauler trailers and auto transporters. No termination date for the exclusions was proposed or is made in the final rule, but manufacturers of these vehicles must be and are hereby placed on notice that these exclusions are not made as permanent exclusions. The temporary exclusions will therefore remain in effect until a final decision is made regarding the reservoir volume and stopping distance requirements for all vehicles. Notice and opportunity for comment will precede any amendment of the reservoir volume and stopping distance requirements.

The CHP requested rewording of the exclusion of auto transporter tractors from the road test requirement in S5.7.1, to avoid confusion over the reference to such requirements in S5.7.3. The wording is changed to expand the exclusion to both S5.7.1 and S5.7.3.

The proposed permanent exclusion from the parking brake requirements for heavy hauler trailers was supported by TTMA and Fontaine Truck Equipment Co., a heavy hauler trailer manufacturer. The CHP expressed the desire that the exclusion be only temporary, and be reviewed in the future when more compact parking brake designs are available. The National Automobile Transporters Association (NATA), and two auto transporter manufacturers, Delavan and Cottrell-Sullivan, requested permanent exclusion from the parking brake requirement for auto transporter trailers as well. Reasons cited were the problems of mounting the parking brake components and the associated air reservoirs without loss of cargo-carrying capacity, lack of availability of more compact hardware, and the short lead time to redesign equipment by January 1, 1979. NATA also noted that auto transporters usually operate as married units, and have a good safety record. Another manufacturer, Traffic Transport Engineering, requested permanent exclusion from the entire standard, based on the same arguments.

The NHTSA is aware that auto transporter manufacturers are presented with difficult hardware packaging problems related to parking brakes on trailers, but is also aware that prototype auto transporters have been built to full compliance with the standard about two years ago. This constitutes strong evidence that such systems can be built on a production basis, and the agency takes note that manufacturers of auto transporters have had four years longer to solve their hardware problems than manufacturers of other types of trailers.

Nevertheless, the agency also recognizes that the availability of new, more compact parking brake systems is dependent on the proposed changes in the parking and emergency brake requirements, which have not yet been implemented. Some additional delay of applicability of the parking brake requirement for auto transporters therefore appears reasonable. An additional delay of one year is provided, with the expectation that any changes in the parking brake requirements will be made final by early 1979, allowing sufficient lead time for manufacturers to incorporate such changes in their trailers. Requests for permanent exclusion from the parking brake requirements or the entire standard for auto transporters are denied, on the grounds that it has been demonstrated that complying vehicles can be designed without significant loss of cargo carrying capacity, and that the additional year's exclusion should compensate for any lead time difficulties. Unlike heavy hauler trailers, auto transporter trailers are not subjected to the same off-road environment that formed the basis for excluding certain vehicle types from the parking brake requirement. The proposed parking brake exclusion of heavy hauler and other trailers is adopted as proposed.

TTMA and three of its members—Birmingham Manufacturing Co., Ferree Trailer Corp., and Fontaine Truck Equipment Co.—repeated their requests for permanent exclusion from the entire standard for heavy hauler trailers, and expressed dismay that all of the points raised in their petition for exclusion had not been addressed in the preamble to the agency's proposal. The NHTSA regrets the brevity of its treatment of the issues in the proposal, but it should not be interpreted as a lack of attention or concern for the problems of the heavy hauler industry. A detailed discussion of the petition and comments to the proposal is being prepared. Copies will be sent to the TTMA and parties who commented on the proposal, and placed in the public docket. Because of its length and technical nature, it is only summarized here.

To place the subject in perspective, it is necessary to first see what portions of the standard apply to heavy hauler trailers. Section S5.1 and S5.7 of the standard apply only to trucks and buses. By this notice, heavy hauler trailers have been permanently excluded from S5.6, and temporarily excluded from S5.3 and parts of S5.2. Section S5.5 applies only if the trailer is antilock-equipped, which is not required according to the Ninth Circuit decision. To the NHTSA's knowledge all heavy hauler trailers already are complying with the applicable portions of S5.2 and S5.8, because of industry standards or BMCS requirements. Thus the only remaining requirements that could necessitate any change in the vehicles are the dynamometer requirements of S5.4.

The assertion that is presented in the TTMA petition, and repeated in the comments to the proposal, is that compliance with Standard No. 121 will necessitate the addition of more axles, resulting in substantially increased cost. This possibility arises because of the current method of rating the capacity of heavy hauler trailers. Axle weight ratings (GAWR's) depend upon the load-carrying capacity of the axle, rims, and tires, and the torque capability of the brakes on the axle. According to industry standards, tires can be rated for higher loads if speed is restricted. Current practice is to rate heavy hauler trailers according to the capacity of the axles and tires, using the tire load capacity ratings at 20 mph. The brakes used are currently not considered in axle rating calculations for the restricted speed rating.

For a trailer subject to Standard No. 121, however, the dynamometer requirements of S5.4.1 require that the brake retardation capability be proportional to the GAWR's. If the retardation capability of the brakes on a trailer is insufficient to meet the minimum performance requirement, a manufacturer must either install more powerful brakes or "derate" the axles to bring the GAWR's in line with the braking capability afforded. In the case of heavy hauler trailers, manufacturers say that they are already using the most powerful brakes available for 15-inch wheels, and those brakes are rated at only 17,000 pounds per axle. The manufacturers assert that since nearly all heavy hauler trailer axles are currently rated for a higher load, the derating to 17,000 pounds per axle necessitated by consideration of brakes in the rating calculations would require them to add more axles to provide the same overall capacities for their trailers.

The data supplied, however, do not support this view. The dynamometer tests are run at 50 mph, and therefore the 17,000-pound axle rating for brakes is a factor in determining the GAWR at that speed. Examination of the load ratings of the tires typically used on heavy hauler trailers (8.25 x 15 and 9.00 x 15) show that their ratings at 50 mph are below 17,000 pounds per axle. Therefore, the tires are the limiting element in determination of GAWR at 50 mph, and the brakes currently being used on these trailers already comply with the dynamometer requirements of the standard with the tires employed.

The misunderstanding apparently arises from the current practice of rating heavy hauler trailers at 20 mph. It is noted that while § 567.4(h)(3) of NHTSA certification regulations (49 CFR Part 567) allows manufacturers to specify GVWR-GAWR ratings for operation of a vehicle at restricted speeds in addition to the unrestricted ratings, the GAWR used for determination of compliance with the dynamometer requirements must be that corresponding to a speed not less than the dynamometer test speed (50 mph). Testing at the restricted speed GAWR would represent an overloaded condition at the dynamometer test speed. The portion of the dynamometer test conditions dealing with GAWR (S6.2.1) is hereby amended to clarify this fact. The only trailers that would actually have to be derated (at 50 mph) would be those using 10.00 x 15 or 11.00 x 15 tires. Very large heavy hauler trailers (over 50 ton capacity) are not affected because they are already permanently excluded by virtue of having a gross vehicle weight rating over 120,000 pounds.

In view of the longer than anticipated time for response to the TTMA petition and the short time remaining before the existing January 1979 effective date, the NHTSA has decided to and hereby delays the effective date for institution of the dynamometer requirements for heavy hauler trailers to July 1, 1979, as requested by TTMA.

CHP suggested changing the word "agriculture" to "agricultural" in the definition of a commodity trailer, and deletion of the phrase "an arrangement of air control lines and reservoirs that minimizes damage in field operation" because it is vague. Midland-Ross commented that straddle trailers would be included in the agricultural commodity trailer definition, and that a separate definition is unnecessary. CHP suggested that the term "logging trailer" be used instead of "pulpwood trailer", and that the definition be reworded to be similar to the definition of agricultural commodity trailer. CHP also suggested deleting the reference to hydraulic lifting arms in the case of straddle trailers, because it is too design restrictive. The NHTSA agrees with the spirit of these suggestions but, in the interests of preserving continuity in interpretation of existing terminology, the changes are only made where they do not conflict with wording already in the standard or in previous interpretations of it.

It is noted that the comments on the parking and emergency brake aspects of the September 14th notice have convinced the NHTSA that further consideration should precede rulemaking changes in this area.

In accordance with Department of Transportation policy for the analysis of regulatory actions, it is found that these amendments of Standard No. 121 do not have significant impact as defined in the Department's criteria for internal review. The changes all permit greater manufacturing flexibility and do not impose any additional requirements. The implementation of some of the standard's requirements for heavy hauler trailers and auto transporters reflects the termination of an exclusion, not new agency action. It is also found that no significant adverse environmental impact will result from these amendments.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended . . . .

Effective date finding: Due to the short time remaining before vehicles would have to be modified to comply with the established January 1979 requirements, it is found that notice and opportunity for comment on the delay of the dynamometer requirements for heavy hauler trailers to July 1, 1979, and the parking brake requirements for auto transporter trailers to January 1, 1980, is impracticable and contrary to the public interest in establishing the final requirements as early as practicable. For the same reason, it is found to be in the public interest to make the relieving amendments effective immediately.

The program official and lawyer principally responsible for the development of this document are Duane Perrin and Tad Herlihy, respectively.

Issued on: December 11, 1978.

Joan Claybrook
Administrator
43 F.R. 58820
December 18, 1978

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Interpretative Amendment

(Docket No. 75-16; Notice 26)

Action: Final rule.

Summary: This notice amends the language of Air Brake Standard 121 to reflect the U.S. Court of Appeals decision in *PACCAR* v. *National Highway Traffic Safety Administration and Department of Transportation.* This action is intended to clear up any confusion about the effect of the court's decision on portions of the standard.

Effective date: August 9, 1979.

For further information contact:

Roger Tilton, Office of Chief Counsel, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. (202-426-9511).

Supplementary information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect since January 1975 for trailers and March 1975 for trucks and buses. Petitions for judicial review of the standard were filed and resulted in invalidation of three aspects of the air brake regulation (see *PACCAR* v. *NHTSA and DOT*, 573 F.2d 632, Cir. 1978, cert denied, October 2, 1978). The agency explained its interpretation of the court's action in three *Federal Register* notices (43 FR 39390, September 5, 1978; 43 FR 48646, October 19, 1978; 43 FR 58820, December 18, 1978) and in several meetings held with equipment and vehicle manufacturers and air-brake vehicle users.

It has become apparent that some confusion exists with regard to the agency's interpretation of the combined effect of two aspects of the court's decision. The first is the agency's view that the court invalidated the "no lockup" portions of S5.3.1 and S5.3.2 insofar as they apply to trucks and trailers, along with the related stopping distances of 293 feet for service brake capability and 613 feet for emergency brake capability (720 for truck-tractors in the unloaded condition) established for 60-mph loaded and unloaded stopping tests under S5.3.1 and S5.7 for trucks. The second is the agency's view that the court invalidated the "skid number" measurement technique of test surface frictional characteristics for use in measuring whether trucks meet the strict stopping distance requirements of the standard. The Court found that while the "skid number" of a surface is an objective measurement, it is not a practicable test method for manufacturers since normal fluctuations for a given road surface would require manufactures to overcompensate by testing their vehicles on road surfaces substantially slicker than the regulation requires. The agency acted to correct the skid number variability problem and measurement technique but subsequently withdrew the correction as it related to skid number variability because of disagreement both over the meaning of the court's opinion and the consequences of the modification adopted (43 FR 58820; December 18, 1978).

Several references by the agency to the fact that the court did not invalidate stopping distance requirements other than the 60-mph stops for trucks have apparently been taken to mean that the agency is in a position to enforce compliance with all remaining stopping distances. The fact that the standard's stopping distances remain completely valid for buses may contribute to this view. In fact, the court's remand to the agency of the skid number specification and duration of time interval between repetitive road tests effectively precludes the agency from enforcing compliance with any road test requirement for trucks and trailers at any speed on wet or dry surfaces. It is apparent that amendment of the language of the standard to reflect the court's actions would be beneficial to end any confusion that may exist. The purpose of this notice is to make that amendment.

It is noted that this action has no effect on the requirements for buses, or on the application and release timing, dynamometer, or parking brake requirements for all vehicles. For this reason, the NHTSA is not amending the test procedures which are applicable to vehicles or requirements other than those addressed by the court.

The agency is amending the application section of the standard to state that trucks and trailers need not comply with certain paragraphs of the regulation. The regulation is being amended in this manner rather than deleting or revising the wording of each of the affected sections in order to disturb the actual text of the standard as little as possible. In that way, the affected sections can most easily be reinstated when suitable solutions to the requirements laid down by the Court are found. In addition, by retaining the standard's language in its existing form, manufacturers are made aware of what the agency still considers to be reasonable standards for minimum acceptable performance, and those manufacturers that wish to construct their vehicles in accordance with the non-mandatory sections of the standard will have the necessary guidance to do so. The agency also has taken this opportunity to delete from S3 references to temporary exclusions which have expired.

Effective date finding: The agency is issuing an interpretative amendment that merely conforms that standard's language to its meaning following the remand by the Ninth Circuit, and therefore the amendment does not change the standard in any respect. Accordingly, it is found for good cause shown that notice and opportunity for comment are unnecessary and that an effective date for the amendments sooner than 30 days from the date of publication in the *Federal Register* is justified.

In consideration of the foregoing, Standard No. 121 (49 CFR 571.121) is amended by replacing the last paragraph of S3 with the following paragraph:

Notwithstanding any language to the contrary, sections S5.3.1, S5.3.1.1, S5.3.2, S5.3.2.1, S5.3.2.2, S5.7.1 and S5.7.3 of this standard are not applicable to trucks and trailers.

The program official and lawyer principally responsible for the development of this document are Duane Perrin and Roger Tilton, respectively.

Issued on: August 3, 1979.

Joan Claybrook
Administrator

44 F.R. 46849
August 9, 1979

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Parking Brakes

(Docket No. 75–16; Notice 27)

Action: Final rule.

Summary: This notice amends the air brake standard to expand the latitude which a vehicle manufacturer has in selecting means to comply with the parking brake requirements. The amendment makes final one of several changes to the parking and emergency brake requirements that had been proposed previously. The other proposed changes have been reexamined in light of comments to the proposal and to a separate proposal outlining plans for replacement of FMVSS 121 by a new standard. . The NHTSA has decided to suspend rulemaking action on those items until research results and other further information is available.

Effective date: August 9, 1979.

For further information contact:

Mr. Duane Perrin, Office of Crash Avoidance, National Highway Traffic Safety Administration, Washington, D.C., 20590 (202–426–2153).

Supplementary information: Standard No. 121 (49 CFR 571.121) regulates the braking system performance of air-braked trucks, buses, and trailers. The standard has been in effect for trailers since January 1, 1975, and for trucks and buses since March 1, 1975. The standard contains requirements for service brake systems, emergency brake systems, and parking brake systems.

More than four years' experience with the standard on the part of manufacturers, users, the agency, and other interested parties indicate a possibility that some of the emergency and parking brake performance requirements could be more broadly stated to allow new design options that offer a level of safety equivalent to that offered by existing designs. On September 14, 1978, the NHTSA issued a notice of proposed rulemaking (43 FR 41056) that would have substantially revised the parking brake requirements for all vehicles and the emergency brake requirements for trailers. Subsequent to the issuance of that proposal, a mandate was issued by the U.S. Court of Appeals for the Ninth Circuit, invalidating certain aspects of FMVSS 121 (43 FR 48646, October 19, 1978). In light of the court decision, the NHTSA has tentatively decided to issue a new heavy duty vehicle brake standard, FMVSS 130, which will eventually replace FMVSS 121. An Advance Notice of Proposed Rulemaking (ANPRM) on Standard No. 130 was issued in February (44 FR 9783, February 15, 1979).

Responses to the ANPRM on Standard No. 130 underscored the need for stability in the industry. To achieve stability, commenters suggested avoiding unnecessary changes in Standard No. 121, which remains in effect until FMVSS 130 is issued. In addition, commenters on the September notice pointed out areas where some of the proposed changes need further research and consideration. For these reasons, most of the changes to the parking and emergency brake sections of Standard No. 121 that were proposed in September are being tentatively put aside. Some of the changes proposed in the September notice may be raised again in the new proposal for Standard No. 130, after further information is obtained by the agency.

The NHTSA has determined, however, that one of the proposed changes should not be delayed until rulemaking is completed on FMVSS 130. That change allows the application of parking brakes by means of service brake air, as long as the application can be made when a failure exists in the service brake system, and as long as the parking brake is held in the applied position by mechanical means. The standard previously required parking brakes to be applied by a separate energy source, and this change allows an alternative to the spring-applied parking brake systems now used. The alternative systems could be less costly and have essentially the same performance as current systems. In addition, the change allows more compact systems to be produced for vehicles such as auto transporters where space for mounting of components is at a premium.

The changes to the parking brake application requirements proposed in September (Docket No. 75-16; Notice 22) were opposed by the California Highway Patrol (CHP), on the assumption that a diaphragm inside a brake chamber is considered part of the brake chamber housing, and that the proposal would have allowed a reduction in safety over current systems. Previous interpretations, however, have clarified that a brake chamber housing is only the outer body of the chamber and does not include the diaphragm. Thus, the prescribed performance must be achieved with any type of failure in the service brake system, including a ruptured diaphragm. The NHTSA concludes, therefore, that this interpretation satisfies the concerns of the CHP. The CHP also suggested a slight rewording to indicate that the required force is applied at the drawbar and not in the parking brake itself. The wording has been changed somewhat to clarify that point.

The American Trucking Associations (ATA) and Transquip Industries objected to the proposal because it would require a second reservoir on an air-applied parking brake system in order for the parking brakes to be applied in the event of a failure of the service reservoir. The NHTSA understands that the use of only one reservoir would reduce cost. However, it would also offer a significant reduction in performance as compared to present systems, because certain service brake system failures could occur for which there would be no secondary means of braking the vehicle. Accordingly, the NHTSA concludes that ATA and Transquip Industries' objections do not warrant any change in the amendment.

Traffic Transport Engineering, an auto transporter manufacturer, requested clarification of whether two relay valves would be required in an air-applied system, since the parking brakes would have to be capable of application with any single failure, and the relay valve could fail. Since relay valve failures are relatively common, the NHTSA considers it necessary to preserve the performance achieved by present systems. Currently, the failure of a relay valve would not prevent emergency application of the trailer brakes. Thus, if a manufacturer chooses to equip a trailer with air-applied parking brakes, he would have to devise a means of achieving a brake application in case of failure of the service brake relay valve. That could be accomplished by using a second relay valve and reservoir.

The Dolphin Brake Corporation asked for clarification of the proposed wording to deterbine whether or not their parking brake that applies by means of hydraulic fluid would meet the requirements. The NHTSA believes that the wording is sufficiently clear to indicate that, like an air-applied system, such a brake would only meet the requirements if a mechanical means of holding the application in the event of loss of fluid pressure were incorporated.

In order to minimize changes to FMVSS 121, the amended wording for application and holding will remain in one paragraph, S5.6.3, as currently in the standard.

Since this amendment relieves a restriction it is being made effective immediately.

In consideration of the foregoing, the first sentence of paragraph S5.6.3 of Standard No. 121 (49 CFR 571.121) is amended . . . .

The principal authors of this notice are Duane Perrin of the Office of Crash Avoidance and Roger Tilton of the Office of Chief Counsel.

Issued on August 6, 1979.

Joan Claybrook
Administrator

44 F.R. 46850
August 9, 1979

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 75–16; Notice 28)

Action: Correction.

Summary: On August 9, 1979, the NHTSA published in the *Federal Register* a final rule amending the applicability section (S3) of Standard No. 121, *Air Brake Systems.* That notice, which added a sentence to the end of S3, contained an error in its reference to section S5.7.3. The notice appears to show that the entire section of S5.7.3 no longer applies to trucks and trailers, when the agency intended only for subparagraphs (a) and (b) to be inapplicable to trucks and trailers. These vehicles do have to comply with S5.7.3(c). Accordingly, the August 9 notice is corrected by changing the last sentence of section S3 to read: Notwithstanding any language to the contrary, sections S5.3.1, S5.3.1.1, S5.3.2, S5.3.2.2, S5.7.1, S5.7.3(a) and S5.7.3(b) of this standard are not applicable to trucks and trailers.

Effective date: September 13, 1979.

For further information contact:

Mr. Scott Shadle, Office of Crash Avoidance, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202–426–2153).

Issued on September 4, 1979.

Michael M. Finkelstein
Associate Administrator for Rulemaking

44 F.R. 53166
September 13, 1979

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Correction

(Docket No. 75-16; Notice 29)

Action: Final rule; correction.

Summary: On August 9, 1979, the NHTSA published in the *Federal Register* a final rule amending the applicability section (S3) of Standard No. 121, *Air Brake Systems.* On September 13, the agency published a correction of that final rule. An error was made in the September 13, correction when reference to section S5.3.2.1 was inadvertently deleted from the notice. . Accordingly, the final rule is corrected by changing the last sentence of section S3 to read: Notwithstanding any language to the contrary, §§ 5.3.1, 5.3.1.1, 5.3.2, 5.3.2.1, 5.3.2.2, 5.7.1, 5.7.3(a) and 5.7.3(b) of this standard are not applicable to trucks and trailers.

Effective date: October 1, 1979.

For further information contact:

Mr. Scott Shadle, Office of Crash Avoidance, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202-426-2153).

Issued on September 25, 1979.

Michael M. Finkelstein
Associate Administrator for
Rulemaking

44 F.R. 57100
October 4, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems

(Docket No. 79-03; Notice 4)

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 121, Air Brake Systems, to require trucks, buses and trailers equipped with air brakes to have service brake systems acting on all wheels. This amendment is being made in response to reports from several manufacturers that some trucks and trailers were soon to be constructed without front axle brakes. The agency concludes that such a change would result in a serious downgrading of existing brake systems and, accordingly, issues this amendment to prevent this from happening.

EFFECTIVE DATE: This amendment is effective July 24, 1980

FOR FURTHER INFORMATION CONTACT:

Mr. John Machey, Crash Avoidance Division,
National Highway Traffic Safety
Administration, 400 Seventh
Street, S.W., Washington, D.C. 20590
(202-426-1714)

SUPPLEMENTARY INFORMATION: On October 18, 1979, the agency published a notice of proposed rulemaking (44 FR 60120) proposing the implementation of a small part of a new safety standard, Standard No. 130, Heavy Duty Vehicle Brake Systems. The agency has also issued two ANPRMs relating to long- and short-term rulemaking issues concerning Standard No. 130. Resolution of the issues raised in those notices will occur after all necessary agency research and analyses have been completed. The October 18 notice, which was very limited in its scope, proposed the implementation of a requirement that heavy duty vehicles have brakes acting on all wheels. The requirement was proposed in response to a developing problem that was brought to the agency's attention by both vehicle and equipment manufacturers concerning front axle brakes.

Standard No. 121, Air Brake Systems, formerly required trucks and trailers to comply with certain stopping distances and other road test requirements. To achieve these requirements, trucks and trailers were equipped with front axle brakes which aid significantly in improving vehicle stopping capability. However, in *PACCAR* v. *NHTSA*, 573 F.2d, 632 (9th Cir. 1978) *cert. den'd* 439 U.S. 862, the road test requirements were invalidated as they apply to trucks and trailers. In light of this development, several manufacturers tentatively decided to remove front axle brakes as a way to reduce slightly the costs associated with the production of heavy duty vehicles.

When the agency discovered that manufacturers intended to remove front axle brakes, the NHTSA reexamined data available to it concerning the effect that such a removal of brakes would have upon the capability of these vehicles to make safe stops. The results of this examination, which were detailed in the proposal and which are available in the docket, lead the agency to conclude that the removal of front axle brakes increases a vehicle's stopping distance. The amount of this increase depends upon the type of vehicle, the vehicle loading and the effectiveness of its remaining brake systems. Sometimes the increase in stopping distances is substantial.

The agency considers any increase in the stopping distance of heavy vehicles to be contrary to the interests of safety. Existing heavy duty vehicles equipped with front axle brakes already have longer stopping distances than many smaller vehicles on the road. This disparity in the stopping distances between large and small vehicles increases the likelihood of accidents between vehicles when both are involved in emergency braking maneuvers. To permit a reduction in the braking capabilities of heavy vehicles, that would result in exacerbating the disparity between the stopping distances of heavy and lighter vehicles, could result in an increased risk of accidents to the occupants of both vehicle groups. To prevent the downgrading of heavy vehicle brake systems, the agency issued its notice of proposed rulemaking to require brakes acting on all wheels.

Sixteen comments were received in response to the notice of proposed rulemaking. Most of the commenters concurred with the agency's attempt to prevent the downgrading of heavy duty vehicle brake systems. However, many of the commenters raised minor objections to the manner in which the proposed action was to be taken.

The largest single complaint from the commenters concerning the proposal was that it would implement only a small portion of a new safety standard. Many commenters suggested that the agency should not implement any part of that standard (Standard No. 130) until all research has been completed and the agency is prepared to issue the standard in its entirety. In connection with this comment, several manufacturers suggested that the proposed amendment would be more appropriately placed in Standard No. 121.

Manufacturers argued the merits of amending Standard No. 121 rather than implementing Standard No. 130 in several ways. First, they argued that by implementing Standard No. 130 in a piecemeal fashion, the agency is subjecting itself to many of the criticisms that have surrounded Standard No. 121. Therefore, they suggested that the agency defer action on Standard No. 130 until a complete standard can be issued. Further, they stated that the implementation of a new safety standard would increase paperwork and would require changes in certification labels and incomplete vehicle documents. They suggest these changes would add costs and would require extending the leadtime before the proposed requirement could become effective. On the other hand, manufacturers stated that an amendment of Standard No. 121 would not require them to change certification labels or modify incomplete vehicle documents. This would lower the costs associated with the proposal. Also, the leadtime for implementing a change in Standard No. 121 would be minimal.

In response to the manufacturers first argument that no portion of Standard No. 130 should be implemented until the entire standard is ready for issuance, the agency disagrees. Currently, the NHTSA is conducting several research programs concerning heavy duty vehicle brakes. Some of this rulemaking is long-term while some is short-term. The agency contemplates implementation of some portions of the short-term rulemaking actions prior to obtaining information on all of its long-term rulemaking goals. This is the typical rulemaking process for many of the agency's standards. It is not in the interest of safety to defer short-term safety gains while waiting for the results of long-term safety rulemaking.

The agency is more persuaded by the manufacturers's second argument that implementation of a portion of Standard No. 130 at this time would unnecessarily impose additional paperwork burdens upon manufacturers, whereas amending Standard No. 121 to accomplish the same result would not increase their paperwork burdens. As the NHTSA indicated in the notice proposing this amendment, the agency seeks only to maintain the existing quality of braking systems. Whether this goal is achieved by amending Standard No. 121 or implementing part of Standard No. 130 is not important to the agency. However, since manufacturers would prefer amending Standard No. 121 and since implementing part of Standard No. 130 would be more costly, the agency agrees with those commenters who would prefer an amendment of Standard No. 121, and that standard is amended by this notice. Several commenters objected to the proposal on the grounds that it was a design standard rather than a performance standard. These commenters suggested that the agency should delay amendments implementing any requirements until the correct performance requirements are developed. The agency disagrees.

All of the agency's safety standards affect design choices to some degree. The very setting of any performance standard implies some narrowing of design choice. Although the agency attempts to minimize the effect, in some instances a significant limitation on design is necessary to secure a particular type of safety improvement. Standard No. 121 does not differ from other safety standards in its effect on design. It uses performance requirements although some elements of design are restricted. Even though this amendment increases slightly the standard's effect on design choice, the standard remains performance oriented. Further, the effect of the old standard was to require brakes acting on all wheels. Although this amendment is more specific in that requirement, the result is the same. Commenters should note that the agency is not specifying the design of the brakes that must be used on each wheel. Accordingly, the NHTSA concludes that this amendment does not substantially or unnecessarily affect design and allows manufacturers significant flexibility in the design and improvement of their braking systems.

As a result of the *PACCAR* decision and the resulting possibility of brake performance downgrading, the agency is forced to take immediate corrective action. The *PACCAR* decision raised questions concerning the stopping distance requirements for trucks and trailers. The Court urged the agency to reexamine its stopping distance requirements and to ensure the propriety of any requirement that might be reimposed. In response, the agency has commenced exploratory rulemaking to determine the appropiate stopping distances for trucks and trailers. When the rulemaking is completed, it is contemplated that stopping distance requirements will be reimposed. The agency cannot reimpose those requirements until the research is completed. Given the absence of stopping distance requirements for trucks and trailers, and the time required for reimplementing stopping distances and the immediate problem of brake system downgrading, the agency must adopt a more expedient approach to prevent the existing levels of safety in heavy-duty vehicle brakes from being reduced.

Kelsey-Hayes supported this rulemaking action but at the same time requested an interpretation of an entirely unrelated section of Standard No. 121. Unrelated requests for interpretations should not be included with docket comments on a specific proposal. The agency will, however, respond to Kelsey-Hayes by a letter or in a separate notice.

In accordance with Executive Order 12044, the agency has reviewed the impacts of this proposed amendment and has determined that it is not significant. Since the amendment will merely require manufacturers to continue to manufacture vehicles as they are doing currently, the costs associated with this amendment will be minimal. Further, the agency has adopted the manufacturers' suggestions to incorporate this amendment in Standard No. 121 to further minimize the possibility of any increased costs.

Since this amendment imposed no additional burdens upon any manufacturer and only requires manufacturers to continue existing manufacturing practices and since it is in the interest of safety to prohibit as soon as possible the manufacture of vehicles without front axle brakes, the amendment is effective 45 days after publication in the Federal Register. In the notice proposing this amendment, commenters objected to an immediate effective date especially if the amendment were made in Standard No. 130. Commenters indicated that more time would be required to change certification labels. Since the amendment is being incorporated into the existing Standard No. 121, the agency considers these objections to the effective date to be no longer valid. Nonetheless, the agency is giving 45 days of leadtime to ensure that all manufacturers have ample time to comply with the requirements.

In accordance with the foregoing, Volume 49 of the Code of Federal Regulations, Part 571 is amended by revising Standard No. 121, Air Brake Systems, as follows:

1. A new paragraph S5.1.8 is added to 49 CFR Part 571.121 to read:

S5.1.8 Brake distribution. Each vehicle shall be equipped with a service brake system acting on all wheels.

2. A new paragraph S5.2.2 is added to 49 CFR Part 571.121 to read:

S5.2.2 Brake distribution. Each trailer shall be equipped with a service brake system acting on all wheels.

The principal authors of this notice are John Machey of the Crash Avoidance Division and Roger Tilton of the Office of Chief Counsel.

Issued on June 2, 1980.

Joan Claybrook
Administrator

45 FR 38380
June 9, 1980

MOTOR VEHICLE SAFETY STANDARD NO. 121

Air Brake Systems—Trucks, Buses and Trailers

(Docket Nos. 70-16, 70-17; Notice No. 2)

S1. Scope. This standard establishes performance and equipment requirements for braking systems on vehicles equipped with air brake systems.

S2. Purpose. The purpose of this standard is to insure safe braking performance under normal and emergency conditions.

S3. Application. This standard applies to trucks, buses, and trailers equipped with air brake systems. However, it does not apply to:

(a) Any vehicle that has an overall vehicle width of more than 102 inches with extendable equipment in the fully retracted position;

(b) Any vehicle equipped with an axle that has a gross axle weight rating (GAWR) of 29,000 pounds or more;

(c) Any truck or bus that has a speed attainable in 2 miles of not more than 33 mph;

(d) Any truck that has a speed attainable in 2 miles of not more than 45 mph, an unloaded vehicle weight that is not less than 95 percent of its GVWR, and no capacity to carry occupants other than the driver and operating crew;

(e) Any trailer that has a gross vehicle weight rating GVWR of more than 120,000 pounds and whose body conforms to that described in the definition of "Heavy hauler trailer" set forth in S4;

(f) Any trailer that has an unloaded vehicle weight which is not less than 95 percent of its GVWR; and

(g) Any load divider dolly.

Notwithstanding any language to the contrary, sections S5.3.1, S5.3.1.1, S5.3.2, S5.3.2.1, S5.3.2.2, S5.7.1, S5.7.3(a) and S5.7.3(b) of this standard are not applicable to trucks and trailers.

S4. Definitions.

"Agricultural commodity trailer" means a trailer that is designed to transport bulk agricultural commodities in off-road harvesting sites and to a processing plant or storage location, as evidenced by skeletal construction that accommodates harvest containers, a maximum length of 28 feet, and an arrangement of air control lines and reservoirs that minimizes damage in field operations.

"Air brake system" means a system that uses air as a medium for transmitting pressure or force from the driver control to the service brake, but does not include a system that uses compressed air or vacuum only to assist the driver in applying muscular force to hydraulic or mechanical components.

"Antilock system" means a portion of a service brake system that automatically controls the degree of rotational wheel slip at one or more road wheels of the vehicle during braking.

"Auto transporter" means a truck and a trailer designed for use in combination to transport motor vehicles, in that the towing vehicle is designed to carry cargo at a location other than the fifth wheel and to load this cargo only by means of the towed vehicle.

"Heavy hauler trailer" means a trailer with one or more of the following characteristics:

(1) Its brake lines are designed to adapt to separation or extension of the vehicle frame; or

(2) Its body consists only of a platform whose primary cargo-carrying surface is not more than 40 inches above the ground in an unloaded condition, except that it may include sides that are designed to be easily removable and a permanent "front-end structure" as that term is used in § 393.106 of this title.

"Initial brake temperature" means the average temperature of the service brakes on the hottest axle of the vehicle 0.2 miles before any brake application.

"Load divider dolly" means a trailer composed of a trailer chassis and one or more axles, with no solid bed, body, or container attached, and which is designed exclusively to support a portion of the load on a trailer or truck excluded from all the requirements of this standard.

"Pulpwood trailer" means a trailer that is designed exclusively for harvesting logs or pulpwood and constructed with a skeletal frame with no means for attachment of a solid bed, body, or container, and with an arrangement of air control lines and reservoirs designed to minimize damage in off-roads operations.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials Method "E–274–70 (as revised July 1974)" at 40 mph, omitting water delivery as specified in paragraphs S7.1 and 7.2" of that method.

"Straddle trailer" means a trailer that is designed to transport bulk agricultural commodities from the harvesting location as evidenced by a framework that is driven over the cargo and lifting arms that suspend the cargo for transit.

"Speed attainable in two miles" means the speed attainable by accelerating at maximum rate from a standing start for two miles on a level surface.

S5. Requirements. Each vehicle shall meet the following requirements under the conditions specified in S6.

S5.1 Required equipment—trucks and buses. Each truck and bus shall have the following equipment:

S5.1.1 Air Compressor. An air compressor of sufficient capacity to increase air pressure in the supply and service reservoirs from 85 pounds per square inch (psi) to 100 (psi) when the engine is operating at the vehicle manufacturer's maximum recommended rpm within a time, in seconds, determined by the quotient

$$\frac{\text{actual reservoir capacity} \times 25}{\text{required reservoir capacity}}$$

S5.1.2 Reservoirs. One or more service reservoir systems, from which air is delivered to the brake chambers, and either an automatic condensate drain valve for each service reservoir or a supply reservoir between the service reservoir system and the source of air pressure.

S5.1.2.1 The combined volume of all service reservoirs and supply reservoirs shall be at least twelve times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms. However, the reservoirs on the truck portion of an auto transporter need not meet this requirement

S5.1.2.2 Each reservoir shall be capable of withstanding an internal hydrostatic pressure of five times the compressor cutout pressure or 500 p.s.i., whichever is greater for 10 minutes.

S5.1.2.3 Each service reservoir system shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and the source of air pressure, by check valves or equivalent devices whose proper functioning can be checked without disconnecting any air line or fitting.

S5.1.2.4 Each reservoir shall have condensate drain valve that can be manually operated.

S5.1.3 Towing vehicle protection system. If the vehicle is intended to tow another vehicle equipped with air brakes, a system to protect the air pressure in the towing vehicle from the effects of a loss of air pressure in the towed vehicle.

S5.1.4 Pressure gauge. A pressure gauge in each service brake system, readily visible to a person seated in the normal driving position, that indicates the service reservoir system air pressure. The accuracy of the gauge shall be within plus or minus 7 percent of the compressor cut-out pressure.

S5.1.5 Warning signal. A signal, other than a pressure gauge, that gives a continuous warning to a person in the normal driving position when the ignition is in the "on" or "run" position and the air pressure in the service reservoir system is below 60 psi. The signal shall be either visible within the driver's forward field of view, or both audible and visible.

S5.1.6 Antilock warning signal. A signal on each vehicle equipped with an antilock system that gives a continuous warning to a person in the normal driving position when the ignition is in the "on" or "run" position in the event of a total electrical failure of the antilock system. The signal shall be either visible within the driver's forward field of view or both audible, for a duration of at least 10 seconds, and continuously visible. The signal shall operate in the specified manner each time the ignition is returned to the "on" or "run" position.

S5.1.7 Service brake stop lamp switch. A switch that lights the stop lamps when the service brake control is statically depressed to a point that produces a pressure of 6 psi or less in the service brake chambers.

[**S5.1.8 Brake distribution.** Each vehicle shall be equipped with a service brake system acting on all wheels. (45 F.R. 38380—June 9, 1980. Effective: 6/24/80)]

S5.2 Required equipment—trailers. Each trailer shall have the following equipment:

S5.2.1 Reservoirs. One or more reservoirs to which the air is delivered from the towing vehicle.

S5.2.1.1 A reservoir shall be provided that is capable, when pressurized to 90 psi, of releasing the vehicle's parking brakes at least once and that is unaffected by a loss of air pressure in the service brake system.

S5.2.1.2 Total service reservoir volume shall be at least eight times the combined volume of all service brake chambers at maximum travel of the pistons or diaphragms. However, the reservoirs on a heavy hauler trailer and on the trailer portion of an auto transporter need not meet this requirement.

S5.2.1.3 Each reservoir shall be capable of withstanding an internal hydrostatic pressure of 500 p.s.i. for 10 minutes.

S5.2.1.4 Each reservoir shall have a condensate drain valve that can be manually operated.

S5.2.1.5 Each service reservoir shall be protected against loss of air pressure due to failure or leakage in the system between the service reservoir and its source of air pressure by check valves or equivalent devices.

[**S5.2.2 Brake distribution.** Each trailer shall be equipped with a service brake system acting on all wheels. (45 F.R. 38380—June 9, 1980. Effective: 6/24/80)]

S5.3 Service brakes—road tests. The service brake system on each truck and bus shall, under the conditions of S6.1, meet the requirements of S5.3.1, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. The service brake system on each trailer shall, under the conditions of S6.1, meet the requirements of S5.3.2, S5.3.3, and S5.3.4 when tested without adjustments other than those specified in this standard. However, a heavy hauler trailer and the truck and trailer portions of an auto transporter need not meet the requirements of S5.3.

S5.3.1 Stopping distance—trucks and buses. Except for a school bus when stopped six times for each combination of weight, speed, and road condition specified in S5.3.1.1, in the sequence specified in Table I, the vehicle shall stop at least once in not more than the distance specified in Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway and without lockup of any wheel at speeds above 10 mph except for

(a) Controlled lockup of wheels allowed by an antilock system, or

(b) Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable, nonsteerable axles on a vehicle with more than two nonsteerable axis.

TABLE I

STOPPING SEQUENCE

1. Burnish
2. Control trailer service brake stops at 60 mph (for truck-tractors tested with a control trailer in accordance with S6.1.10.6).
3. Control trailer emergency brake stops at 60 mph (for truck-tractors tested with a control trailer in accordance with S6.1.10.7).
4. Stops with vehicle at gross vehicle weight rating:
   - (a) 20 mph service brake stops on skid number of 81.
   - (b) 60 mph service brake stops on skid number of 81.
   - (c) 20 mph service brake stops on skid number of 30.
   - (d) 20 mph emergency brake stops on skid number of 81.
   - (e) 60 mph emergency brake stops on skid number of 81.
5. Parking brake test with vehicle loaded to gross vehicle weight rating.
6. Stops with vehicle at unloaded weight plus 500 lb.:
   - (a) 20 mph service brake stops on skid number of 81.

(b) 60 mph service brake stops on skid number range 81.

(c) 20 mph service brake stops on skid number range 30.

(d) 20 mph emergency brake stops on skid number range 81.

(e) 60 mph emergency brake stops on skid number range 81.

7. Parking brake test with vehicle at unloaded weight plus 500 lb.

S5.3.1.1 Stop the vehicle from 60 m.p.h. and 20 mph on a surface with a skid number of 81, and from 20 mph on a wet surface with a skid number of 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation). If the speed attainable in 2 miles is less than 60 mph, the vehicle shall stop from a speed in Table II that is 4 to 8 mph less than the speed attainable in 2 miles.

TABLE II.—Stopping Distance in Feet

	Service Brake stopping distance		Emergency Brake stopping distance	
Vehicle speed in miles per hour	Column 1 Skid Skid No. 81	Column 2 Skid No. 30	Column 3 Skid No. 81	Column 4
20	35	60	83	85
25	53		123	131
30	75		170	186
35	101		225	250
40	131		288	325
45	165		358	409
50	203		435	504
55	246		520	608
60	293		613	720

S5.3.2. Stopping capability—trailers. When tested at each combination of weight, speed, and road condition specified in S5.3.2.1, in the sequence specified in Table I, with air pressure of 90 psi in the control line and service reservoir system and with no application of the towing vehicle's brakes, a trailer shall stop without any part of the trailer leaving the roadway and without lockup of any wheel at speeds above 10 mph, except for

(a) Controlled lockup of wheels allowed by an antilock system; or

(b) Lockup of wheels on nonsteerable axles other than the two rearmost nonliftable; nonsteerable axles on a trailer with more than two nonsteerable axles; or

(c) In the case of an axle system having more than four wheels, lockup of any wheel other than the outermost wheel at each end of the axle system.

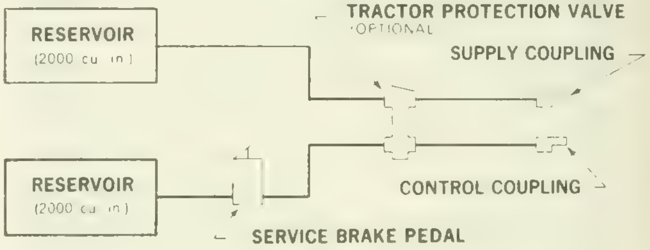
S5.3.2.1 Stop the vehicle from 60 m.p.h. and 20 mph on a surface with skid number of 81, and from 20 mph on a wet surface with a skid number 30, with the vehicle (a) loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including instrumentation).

S5.3.2.2 When stopped in accordance with S5.3.2, a pulpwood trailer need not meet the requirements relating to wheel lockup, but must nevertheless meet the requirements of staying within the 12-foot lane.

S5.3.3 Brake actuation time. With an initial service reservoir system air pressure of 100 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, reach 60 psi in not more than 0.45 seconds in the case of trucks and buses, 0.35 seconds in the case of trailer converter dollies, and 0.30 seconds in the case of trailers other than trailer converter dollies. A vehicle designed to tow a vehicle equipped with air brakes shall be capable of meeting the above actuation time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above actuation time requirement with its brake system connected to the test rig shown in Figure 1.

FIGURE 1

TRAILER TEST RIG



S5.3.4 Brake release time. With an initial service brake chamber air pressure of 95 psi, the air pressure in each brake chamber shall, when measured from the first movement of the service brake control, fall to 5 psi in not more than 0.55 seconds in the case of trucks and buses, and fall to 5 psi in not more than 0.65 seconds in the case of trailers, including trailer converter dollies. A vehicle designed to tow another vehicle equipped with air brakes shall be capable of meeting the above release time requirement with a 50-cubic-inch test reservoir connected to the control line coupling. A trailer, including a trailer converter dolly, shall meet the above release time requirements with its brake system connected to the test rig shown in Figure 1.

S5.4 Service brake system—dynamometer tests. When tested without prior road testing, under the conditions of S6.2, each brake assembly shall meet the requirements of S5.4.1, S5.4.2, and S5.4.3 when tested in sequence and without adjustments other than those specified in the standard. For purposes of the requirements of S5.4.2 and S5.4.3, an average deceleration rate is the change in velocity divided by the deceleration time measured from the onset of deceleration. However, a brake assembly on a heavy hauler trailer manufactured before July 1, 1979, need not meet the requirements of this section.

S5.4.1 Brake retardation force. The sum of the retardation forces exerted by the brakes on each vehicle designed to be towed by another vehicle equipped with air brakes shall be such that the quotient

$$\frac{\text{sum of the brake retardation forces}}{\text{sum of GAWRs}}$$

relative to brake chamber air pressure shall have values not less than those shown in Column 1 of Table III. Retardation force shall be determined as follows:

TABLE III.—BRAKE RETARDATION FORCE

BRAKE RETARDATION FORCE GAWR Column 1	BRAKE CHAMBER PRESSURE, p.s.i. Column 2
0.05	20
0.12	30
0.18	40
0.25	50
0.31	60
0.37	70
0.41	80

S5.4.1.1 After burnishing the brake pursuant to S6.2.6, retain the brake assembly on the inertia dynamometer. With an initial brake temperature between 125°F and 200°F, conduct a stop from 50 mph, maintaining brake chamber air pressure at a constant 20 psi. Measure the average torque exerted by the brake from the time the specified air pressure is reached until the brake stops and divide by the static loaded tire radius specified by the tire manufacturer to determine the retardation force. Repeat the procedure six times, increasing the brake chamber air pressure by 10. After each stop, rotate the brake drum or disc until the temperature of the brake falls to between 125°F. and 200°F.

S5.4.2 Brake power. When mounted on an inertia dynamometer, each brake shall be capable of making 10 consecutive decelerations at an average rate of 9 fpsps from 50 mph to 15 mph, at equal intervals of 72 seconds, and shall be capable of declerating to a stop from 20 mph at an average deceleration rate of 14 fpsps one minute after the 10th acceleration. The series of decelerations shall be conducted as follows:

S5.4.2.1 With an initial brake temperature between 150°F and 200°F for the first brake application, and the drum or disc rotating at a speed equivalent to 50 mph, apply the brake and decelerate at an average deceleration rate of 9 fpsps to 15 mph. Upon reaching 15 mph, accelerate to 50 mph and apply the brake for a second time 72 seconds after the start of the first application. Repeat the cycle until 10 decelerations have been made. The service line air pressure shall not exceed 100 psi during any deceleration.

S5.4.2.2 One minute after the end of the last deceleration required by S5.4.2.1 and with the drum or disc rotating at a speed of 20 mph, decelerate to a stop at an average deceleration rate of 14 fpsps.

S5.4.3 Brake recovery. Starting 2 minutes after completing the tests required by S5.4.2, the brake of a vehicle other than either front axle brake of a truck-tractor shall be capable of making 20 consecutive stops from 30 mph at an average deceleration rate of 12 ft/s/s, at equal intervals of 1 minute measured from the start of each brake application. The service line air pressure needed to attain a rate of 12 ft/s/s shall be not more than 85 lb./in.^{2}, and not less than 20 lb./in.^{2} for a brake not subject to the control of an antilock system, or 12 lb./in.^{2} for a brake subject to the control of an antilock system.

S5.5 Antilock system.

S5.5.1 Antilock system failure. On a vehicle equipped with an antilock system, electrical failure of any part of the antilock system shall not increase the actuation and release times of the service brakes.

S5.5.2 Antilock system power—trailers. On a trailer equipped with an antilock system that requires electrical power for operation, the power shall be obtained from the stop lamp circuit. Additional circuits may also be used to obtain redundant sources of electrical power.

S5.6 Parking brake system. Each vehicle other than a trailer converter dolly shall have a parking brake system that under the conditions of S6.1 meets the requirements of S5.6.1 or S5.6.2, at the manufacturer's option, and the requirements of S5.6.3 and S5.6.4. However, the trailer portion of an auto transporter manufactured before January 1, 1980 and any agricultural commodity trailer, heavy hauler trailer, or pulpwood trailer, shall meet the requirements of this section, or, at the option of the manufacturer, the requirements of § 393.43 of the title.

S5.6.1 Static retardation force. With all other brakes rendered inoperative, during a static drawbar pull in a forward or rearward direction, the static retardation force produced by the application of the parking brakes shall be:

(a) In the case of a vehicle other than a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GAWR}}$$

is not less than 0.28 for any axle other than a steerable front axle; and

(b) In the case of a truck-tractor that is equipped with more than two axles, such that the quotient

$$\frac{\text{static retardation force}}{\text{GVWR}}$$

is not less than 0.14.

S5.6.2 Grade holding. With all parking brakes applied, the vehicle shall remain stationary facing uphill and facing downhill on a smooth, dry portland cement concrete roadway with a 20% grade, both (a) when loaded to its gross vehicle weight rating, and (b) at its unloaded vehicle weight plus 500 pounds (including driver and instrumentation).

S5.6.3 Application and holding. The parking brake system shall be capable of achieving the minimum performance specified either in S5.6.1 or S5.6.2 with any single leakage-type failure in any other brake system, of a part designed to contain compressed air or brake fluid (except failure of a component of a brake chamber housing). Once applied, the parking brakes shall be held in the applied position solely by mechanical means.

S5.6.4 Parking brake control—trucks and buses. The parking brake control shall be separate from the service brake control. It shall be operable by a person seated in the normal driving position. The control shall be identified in a manner that specifies the method of control operation. The parking brake control shall control the parking brakes of the vehicle and of any air braked vehicle that it is designed to tow.

S5.7 Emergency brake system—trucks and buses. Each vehicle shall be equipped with an emergency brake system which, under the conditions of S6.1, conforms to the requirements of S5.7.1through S5.7.3. However, the truck portion of an auto transporter need not meet the road test requirements of S5.7.1 and S5.7.3.

S5.7.1 Emergency brake system performance. When stopped six times for each combination of weight and speed specified in S5.3.1.1 on a road surface with a skid number of 81, with a single failure in the service brake system of a part designed to contain compressed air or brake fluid (except failure of a common valve, manifold brake fluid housing, or brake chamber housing), the vehicle shall stop at least once in not more than the distance specified in Column 3 of Table II, measured from the point at which movement of the service brake control begins, without any part of the vehicle leaving the roadway, except that a truck-tractor tested at its unloaded vehicle weight plus 500 pounds shall stop at least once in not more than the distance specified in Column 4 of Table II.

S5.7.2 Emergency brake system operation. The emergency brake system shall be applied and released, and be capable of modulation, by means of the service brake control.

S5.7.3 Towing vehicle emergency brake requirements. In addition to meeting the other requirements of S5.7, a vehicle designed to tow another vehicle equipped with air brakes shall—

(a) In the case of a truck-tractor in the unloaded condition and a single unit truck which is capable of towing an air-brake equipped vehicle and is loaded to gross vehicle weight rating, be capable of meeting the requirements of S5.7.1 by operation of the service brake control only, with the trailer air supply line and air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14;

(b) In the case of a truck-tractor loaded to gross vehicle weight rating, be capable of meeting S5.7.1 by operation of the service brake control only, with the air control line from the towing vehicle vented to the atmosphere in accordance with S6.1.14; and

(c) Be capable of modulating the air in the supply or control line to the trailer by means of the service brake control with a single failure in the towing vehicle service brake system as specified in S5.7.1.

S5.8 Emergency braking capability—trailers. Each trailer other than a trailer converter dolly shall have a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure. A trailer converter dolly shall have, at the manufacturer's option, (a) a parking brake system that conforms to S5.6 and that applies with the force specified in S5.6.1 or S5.6.2 when the air pressure in the supply line is at atmospheric pressure, or (b) an emergency system that automatically controls the service brakes when the service reservoir is at any pressure above 20 lb./in.^{2} and the supply line is at atmospheric pressure. However, the trailer portion of an auto transporter manufactured before January 1, 1980, and any agricultural commodity trailer, heavy hauler trailer, or pulpwood trailer shall meet the requirements of this section or, at the option of the manufacturer, the requirements of § 393.43 of this title.

S6. Conditions. The requirements of S5 shall be met under the following conditions. Except as otherwise specified, where a range of conditions is specified, the vehicle must be capable of meeting the requirements at all points within the range.

Compliance of vehicles manufactured in two or more stages may, at the option of the final-stage manufacturer, be demonstrated to comply with this standard by adherence to the instructions of the incomplete vehicle manufacturer and any intermediate-stage manufacturer provided with the vehicle in accordance with § 568.1(a) (7) (ii) and § 568.5 of Title 49, Code of Federal Regulations.

S6.1 Road test conditions.

S6.1.1 Except as otherwise specified, the vehicle is loaded to its gross vehicle weight rating, distributed proportionally to its gross axle weight ratings.

S6.1.2 The inflation pressure is as specified by the vehicle manufacturer for the gross vehicle weight rating.

S6.1.3 Unless otherwise specified, the transmission selector control is in neutral or the clutch is disengaged during all decelerations and during static parking brake tests.

S6.1.4 All vehicle openings (doors, windows, hood, trunk, cargo doors, etc.) are in a closed position except as required for instrumentation purposes.

S6.1.5 The ambient temperature is between 32°F and 100°F.

S6.1.6 The wind velocity is zero.

S6.1.7 Unless otherwise specified, stopping tests are conducted on a 12-foot wide, level, straight roadway having a skid number of 81, inclusive, chosen at the option of the manufacturer. The vehicle is aligned in the center of the roadway at the beginning of the stop.

S6.1.8 The brakes are burnished before testing in accordance with S6.1.8.1. However, for vehicles with parking brake systems not utilizing the service brake friction elements, burnish the friction elements of such systems prior to the parking brake test according to the manufacturer's recommendations.

S6.1.8.1 With the transmission in the highest gear appropriate for the series given in Table IV make 500 brake applications at a deceleration rate of 10 ft/s/s, or at the vehicle's maximum deceleration rate, if not less than 10 ft/s/s, in the sequence specified in Table IV. After each brake application, accelerate to the speed specified and maintain that speed until making the next brake application at a point 1 mile from the initial point of the previous brake application. If a vehicle cannot attain the specified speed in 1 mile, continue to accelerate until the specified speed is reached or until the vehicle has traveled 1.5 miles from the initial point of the previous brake application. If during any of the brake applications specified in Table IV, the hottest brake raches 500° F, make the remainder of the 500 applications from that snub condition except that a higher or lower snub condition shall be used as necessary to maintain an after-stop temperature of 500° F±50° F. Any automatic pressure limiting valve is in use to limit pressure as designed, except that any automatic front axle pressure limiting valve is bypassed if the temperature of the hottest brake on a rear axle exceeds the temperature of the hottest brake on a front axle by more than 125°F. A bypassed valve is reconnected if the temperature of the hottest brake on a front axle exceeds the temperature of the hottest brake on a rear axle by 100° F.After burnishing, adjust the brakes as recommended by the vehicle manufacturer.

Table IV

Series	Snubs	Snub conditions (highest speed specified)
1	175	40 to 20 mph.
2	25	45 to 20 mph.
3	25	50 to 20 mph.
4	25	55 to 20 mph.
5	250	60 to 20 mph.

S6.1.9 Static parking brake tests for a semitrailer are conducted with the front end supported by an unbraked dolly. The weight of the dolly is included as part of the trailer load.

S6.1.10 In a test other than a static parking brake test, a truck-tractor is tested at its gross vehicle weight rating by coupling it to a flatbed semitrailer (hereafter, control trailer) as specified in S6.1.10.1 to S6.1.10.7.

S6.1.10.1 The control trailer conforms to this standard.

S6.1.10.2 The center of gravity of the loaded control trailer is on the trailer's longitudinal centerline at a height of 66±3 in. above the ground.

S6.1.10.3 For a truck-tractor with a rear axle gross axle weight rating of 26,000 lb or less, the control trailer has a single axle with a gross axle weight rating of 18,000 lb and a length, measured from the transverse centerline of the axle to the centerline of the kingpin, of 258±6 in.

S6.1.10.4 For a truck-tractor with a total rear axle gross axle weight rating of more than 26,000 lb the control trailer has a tandem axle with a combined gross axle weight rating of 32,000 lb and a length, measured from the transverse centerline between the axles to the centerline of the kingpin, of 390±6 in.

S6.1.10.5 The control trailer is loaded so that its axle is loaded to its gross axle weight rating and the tractor is loaded to its gross vehicle weight rating, with the tractor's fifth wheel adjusted so that the load on each axle measured at the tire-ground interface is most nearly proportional to the axles' respective gross axle weight ratings.

S6.1.10.6 Test equipment specification. The control trailer's service brakes are capable of stopping the combination from the maximum, speed at which the tractor is tested, under the conditions of S6.1, without assistance from the tractor brakes, in the distance found by multiplying the value 68, 90, 115, 143, 174, 208, or 245 (corresponding to a speed of 30, 35, 40, 45, 50, 55, or 60 mph as appropriate for the truck-tractor tested) by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the tractor's fifth wheel adjusted as specified in S6.1.10.5, the trailer service reservoirs pressurized to 100 lb./in.^{2}, and the trailer loaded so that its axle is at gross axle weight rating and its kingpin is at empty vehicle weight. The stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. The service brake chambers on the trailer reach 60 lb./in.^{2} in not less than 0.20 second and not more than 0.30 second, measured from the instant at which movement of the valve controlling the trailer brakes begins.

S6.1.10.7 Test equipment specification. The control trailer's emergency brakes are capable of stopping the combination under the conditions of S6.1 from the maximum speed at which the tractor is tested, without assistance from the tractor's brakes, in the distance found by multiplying the emergency brake stopping distance in column 3 of Table II by the ratio:

$$\frac{\text{weight on all axles of combination}}{\text{weight on trailer axles}}$$

with the combination loaded in accordance with S6.1.10.5. Stopping distance is measured from the point at which movement of the valve controlling the trailer brakes begins. In the case of control trailers that utilize parking brakes for emergency stopping capability, the pressure in the trailer's spring parking brake chambers falls from 95 lb./in.^{2} to 5 lb./in.^{2} in not less than 0.50 second and not more than 0.60 second, measured from the instant at which movement of the valve controlling the trailer's spring parking brakes begins.

S6.1.11 Special drive conditions. A vehicle equipped with an interlocking axle system of a front wheel drive system that is engaged and disengaged by the driver is tested with the system disengaged.

S6.1.12 Liftable axles. A vehicle with a liftable axle is tested at gross vehicle weight rating with the liftable axle down and at unloaded vehicle weight with the liftable axle up.

S6.1.13 The trailer test rig shown in Figure 1 is capable of increasing the pressure in a 50 cubic inch reservoir from atmospheric to 60 lb./in.^{2} in 0.06 second, measured from the first movement of the service brake control to apply service brake pressure and of releasing pressure in such a reservoir from 95 to 5 lb./in.^{2} in 0.22 second measured from the first movement of the service brake control to release service brake pressure.

S6.1.14 In testing the emergency braking system of towing vehicles under S5.7.3(a) and S5.7.3(b) the hose(s) is vented to the atmosphere at any time not less than 1 second and not more than 1 minute before the emergency stop begins, while the vehicle is moving at the speed from which the stop is to be made and any manual control for the towing vehicle protection system is in the position to supply air and brake control signals to the vehicle being towed. No brake application is made from the time the line(s) is vented until the emergency stop begins and no manual operation of the parking brake system or towing vehicle protection system occurs from the time the line(s) is vented until the stop is completed.

S6.2 Dynamometer test conditions.

S6.2.1 The dynamometer inertia for each wheel is equivalent to the load on the wheel with the axle loaded to its gross axle weight rating. For a vehicle having additional gross axle weight ratings specified for operation at reduced speeds, the GAWR used is that specified for a speed of 50 mph, or, at the option of the manufacturer, any speed greater than 50 mph.

S6.2.2 The ambient temperature is between 75° F and 100° F.

S6.2.3 Air at ambient temperature is directed uniformly and continuously over the brake drum or disc at a velocity of 2,200 feet per minute.

S6.2.4 The temperature of each brake is measured by a single plus type thermocouple installed in the center of the lining surface of the most heavily loaded shoe or pad as shown in Figure II. The thermocouple is outside any center groove.

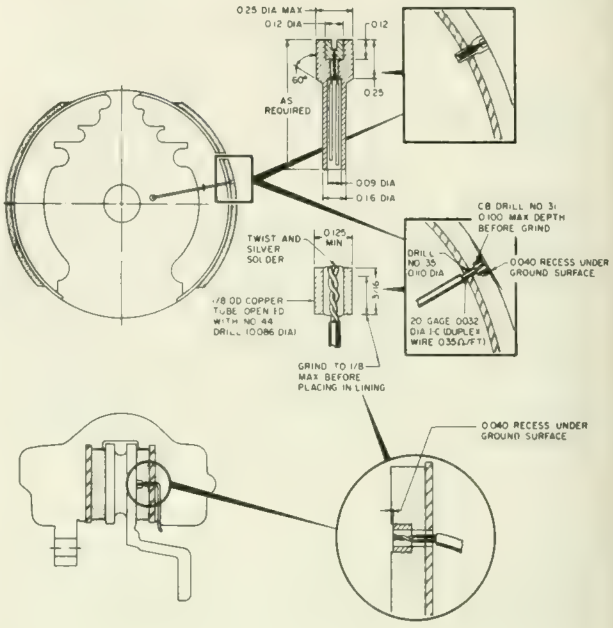
S6.2.5 The rate of brake drum or disc rotation on a dynamometer corresponding to the rate of rotation on a vehicle at a given speed is calculated by assuming a tire radius equal to the static loaded radius specified by the tire manufacturer.

S6.2.6 Brakes are burnished before testing as follows: Place the brake assembly on an inertia dynamometer and adjust the brake as recommended by the brake manufacturer. Make 200 stops from 40 mph at a deceleration of 10 fpsps, with an initial brake temperature on each stop of not less than 315°F and not more than 385°F. Make 200 additional stops from 40 mph at a deceleration of 10 fpsps with an initial brake temperature on each stop of not less than 450°F and not more than 550°F. After burnishing, the brakes are adjusted as recommended by the brake manufacturer.

S6.2.7 The brake temperature is increased to a specified level by conducting one or more stops from 40 mph at a deceleration of 10 fpsps. The brake temperature is decreased to a specified level by rotating the drum or disc at a constant 30 mph.

FIGURE 2

THERMOCOUPLE INSTALLATION


0 25 DIA MAX
0 12 DIA
0 12
60°
AS REQUIRED
0 25
0 09 DIA
0 16 DIA
CB DRILL NO 31 0 100 MAX DEPTH BEFORE GRIND
TWIST AND SILVER SOLDER
0 125 MIN
DRILL NO 35 0 110 DIA
0 040 RECESS UNDER GROUND SURFACE
3/16
1/8 OD COPPER TUBE OPEN ID WITH NO 44 DRILL (0 086 DIA)
20 GAGE 0 032 DIA I-C (DUPLEX WIRE 0 35Ω/FT)
GRIND TO 1/8 MAX BEFORE PLACING IN LINING
0 040 RECESS UNDER GROUND SURFACE

36 F.R. 3817
February 27, 1971

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 122 (49 CFR § 571.-122) that establishes performance requirements for motorcycle brake systems. A notice of proposed rulemaking on this subject was published on March 24, 1971 (36 F.R. 5516).

The safety afforded by a motorcycle's braking system is determined by several factors, including stopping distance, linear stability while stopping, fade resistance, and fade recovery. A safe system should have features that both guard against malfunction and stop the vehicle should a malfunction occur in the normal service system. Standard No. 122 covers each of these aspects of brake safety, establishing equipment and performance requirements appropriate for two-wheeled and three-wheeled motorcycles. These requirements do not differ greatly from the proposals, and comments received in response to the notice have been considered in promulgating the rule.

I. *Equipment.* Each motorcycle is required to have either a split hydraulic service brake system or two independently actuated service brake systems. The latter system encompasses a hydraulic service brake system combined with a hand operated parking brake system. Although several objections were received to the split hydraulic service brake system proposal, the NHTSA has determined that partial failure braking features are necessary in the event of a hydraulic pressure loss in the normal service brake system. If a motorcycle has a hydraulic service brake system, it must also have a reservoir for each master cylinder, and a master cylinder reservoir label advising the proper grade of DOT brake fluid. If the service brake system is a split hydraulic type, a failure indicator lamp is required.

Additionally, three-wheeled motorcycles must be equipped with a friction type parking brake with a solely mechanical means to retain engagement. Some commenters felt that pin or pawl type brakes should be permitted. The Administration does not know of an impact test adequate to test the strength of a mechanical lock, and pin or pawl type brakes, prone to failure upon impact, have been found to be inadequate. The NHTSA concurs, however, with comments objecting to the proposed parking brake indicator lamp, and has determined that the safety benefits involved are negligible in comparison with the expense of providing it.

II. *Performance.* Conformity with performance requirements will be determined by subjecting motorcycles to a series of road tests. Vehicles must demonstrate the effectiveness of their service brake systems by stopping within specified distances from 30 mph, 60 mph, 80 mph, and from a speed divisible by 5 mph that is 4 mph to 8 mph less than the maximum vehicle speed.

Motorcycles will demonstrate fade resistance of their braking systems by making recovery stops subsequent to a series of fade stops from 60 mph. The hand lever force for the final recovery stop must be within plus 20 pounds and minus 10 pounds of the baseline check average force. This is a modification of the proposed "plus 10 pounds or 20 percent, whichever, is less, and minus 20 percent," based upon comments requesting the substitution of absolute values. The same modification is made in the final water recovery stop. The maximum speed fade and recovery proposal has not been adopted, as two and three-wheeled motor vehicles do not have the inherent cooling problems that braking systems on four-wheeled vehicles experience. Retention of the 60 mph stops will ensure that the system maintain adequate stopping ability despite the high temperatures created by prolonged use, and may reveal undesirable brake lining characteristics such as glazing.

The test sequence has been rearranged so that the parking brake system test for three-wheeled motorcycles occurs immediately before the water recovery test. At this point in the test sequence the brakes will have been fully burnished, and the test will therefore be more indicative of service performance. Parking brake application forces have been modified from the proposal, and specify a maximum applied force of not more than 90 pounds for a foot-operated system and 55 pounds for a hand-operated system. These forces are identical to those specified in S6.10, the test condition on brake actuation forces, and result in a uniformity of brake actuation forces throughout the standard.

Finally, a motorcycle must demonstrate acceptable stopping performance after its brake system has been exposed to water. Comments expressed dissatisfaction with the proposed test procedure, stating that complete immersion of the brakes is not indicative of the manner in which they become wet in actual service. NHTSA agrees that poor braking performance often is not attributable to complete immersion, but rather to prolonged exposure to a constant spray from the road surface. However, there is no basis on which to specify a test procedure reflecting these conditions, and the immersion procedure has, therefore, been retained.

At the end of the test procedure the brake system must pass a durability inspection.

All stops must be made without lockup of any wheel. Two-wheeled motorcycles must remain within an 8-foot-wide lane during stops (modified from the proposed 6-foot-wide lane), and three-wheeled ones within a lane equal to vehicle width plus five feet. Some commenters asked that tests be performed with the clutch engaged. However, the effectiveness of a brake system in bringing a vehicle to a stop within required distances is more accurately judged by requiring that stops be made with the clutch disengaged; there is less reliance on extraneous factors such as use of engine retardation as a braking assist and the varying skills of individual drivers when shifting downward through gears.

Regarding test conditions, comments were received that it is unnecessary for both braking systems of a two-wheeled motorcycle to be within the specified pedal and lever force range simultaneously. The Administration did not concur with these comments. The safety of cyclists requires not only that motorcycles be capable of stopping within specified distances, but also that this capability be demonstrated when reasonable forces are applied to the brake lever and pedal.

Several commenters also objected to the "impossibility" of the test condition that "the wind velocity is zero." The comment reveals misunderstanding of the significance of the test conditions. A manufacturer may test for compliance by running the tests under any wind conditions that are adverse to the vehicle; obviously if the vehicle meets the requirements under adverse wind conditions, it will meet them under no-wind conditions. Similarly, the Government will prove noncompliance by orienting the test runs so that wind conditions are favorable to the vehicle. Thus, the condition uniquely allows testing under whatever wind conditions are present. It is retained as the most practicable and least burdensome test method for all parties.

Effective date: September 1, 1973. Because of the necessity to allow manufacturers sufficient production leadtime, it is found for good cause shown, that an effective date later than one year after issuance is in the public interest.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by adding § 571.122, Motor Vehicle Safety Standard No. 122, *Motorcycle Brake System.*

This notice is issued under the authority of section 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on: March 1, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 5033
March 9, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

(Docket No. 1–3; Notice No. 4)

This notice responds to petitions for reconsideration of Motor Vehicle Safety Standard No. 122 (49 CFR § 571.122), and changes the effective date of the standard to January 1, 1974.

Motor Vehicle Safety Standard No. 122 establishing requirements for motorcycle braking equipment, stopping distance, brake system fade and recovery, and wet brake recovery, effective September 1, 1973, was published on March 9, 1972 (37 F.R. 5033). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the rule were filed by Japan Automobile Manufacturers Association, Inc. ("JAMA"), and Cushman Motors ("Cushman") through counsel. In response to these petitions, the effective date of the standard is being changed. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Lining inspection requirement.* S5.1.5 of Standard No. 122 requires a brake system to be installed "so that the lining thickness of drum brake shoes may be visually inspected, either directly or by use of a mirror without removing the drums. . . ." JAMA has petitioned that the word "indirectly" be substituted for "by use of a mirror" in order to allow use of a device such as a wear indicator on the outside of front and rear brake panels. The NHTSA considers wear indicators to be a "direct" method of visual inspection since the extent of lining wear may be determined without removal of the drums. There is no need to amend the Standard to allow their use, and JAMA's petition is denied.

2. *Brake wetting procedure.* The procedure for wetting the brakes prior to testing for wet brake recovery (S7.10.2) specifies the complete immersion of brake assemblies.

JAMA has petitioned that a water trough be substituted, with water depth varying according to the cycle's tire rim size, through which the cycle would be driven for 2 minutes at a speed of 10 m.p.h. JAMA notes that this is similar to the procedure NHTSA proposed in Docket No. 70–27, *Hydraulic Brake Systems*, and commented that the same procedure should apply to all motor vehicles.

The NHTSA has determined that the inherent instability of two- and three-wheeled vehicles under wet road conditions justifies a different test procedure. The difference in configuration between motorcycles and four-wheeled vehicles is distinct enough that there is no assurance motorcycle brakes will be wet, or wet uniformly, by the trough method. It is recognized that neither method may represent the way brakes become wet under actual road conditions, but immersion of brake assemblies has been determined to be the more efficiently reproducible method of establishing a condition under which motorcycle brake system performance may be evaluated. The petition is denied.

3. *Stopping distance.* JAMA and Cushman petitioned for a relaxation of the stopping distance requirements of Table I. JAMA recommended that the stopping distance values in Column II (Preburnish effectiveness, partial mechanical system) and Column III (Effectiveness—total system) up to and including 70 m.p.h. be the stopping distances specified in SAE Recommended Practice J109a. This would mean an increase in range of 39–136 feet for the preburnish stopping distances, and 1–15 feet for total system effectiveness over the values of Standard No. 122. JAMA alleges that stopping distance is highly dependent upon the rider's

ability to control the brakes, and it requested the increased stopping distances to compensate for variations in the rider's skill.

Cushman, whose three-wheeled vehicles have a top speed of 38 m.p.h., requests that all stopping distances from 30 m.p.h. and 35 m.p.h. be modified, alleging that the only way it can meet the stopping distances is by redesigning its vehicle. Cushman also states that it is unaware of any incident where the stopping distances achieved by its present vehicle have become a factor in an accident, and that accordingly there is no need for the stopping distances set forth in Table I, as they apply to Cushman, in order to protect the public.

The NHTSA recognizes that its standards on braking (the forthcoming amendment to Standard No. 105, *Hydraulic Brake Systems*, Standard No. 121, *Air Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*) impose stringent requirements on the manufacturers of all types of vehicles, and that, in some instances, redesign may be necessary. But because of the ever increasing numbers of vehicles on urban and interstate roadways, and of passenger-miles traveled, the NHTSA considers improved braking systems to be the highest priority in its program of accident avoidance. Prompt and accurate braking response is deemed especially critical in providing a margin by which the vulnerable motorcyclist may escape death or serious injury. While the fatality rate for all motor vehicle occupants fell 3.8 per cent in 1970, it rose 18.9 per cent for motorcycle riders. Motorcycles account for less than 2.3 per cent of total vehicle registrations, but they are involved in 3.6 per cent of all fatal accidents. Therefore, the necessity that the industry achieve the full capability of the present state of the art has been found to outweigh the problems caused the individual manufacturers by compliance.

The NHTSA recognizes the effect of rider control upon stopping distance in the wording of S7. which deems stopping distance requirements met if only one of the specified number of stops occurs within the maximum allowable stopping distances. Comments to Docket No. 1–3 indicate that it is clearly reasonable and practicable to require motorcycles to meet the stopping distances adopted for Standard No. 122. The petitions of JAMA and Cushman are denied.

4. *Effective date.* JAMA has requested a 4 month delay in the effective date of Standard No. 122 because model changeover time for Japanese manufacturers extends through autumn to the end of the year. It estimates that only 50 per cent of the industry could be brought into compliance by September 1, 1973. In light of the design changes that may be necessitated, the Administrator finds this request reasonable and that for good cause shown a later effective date is in the public interest. The effective date of Standard No. 122 is hereby changed to January 1, 1974.

The notice is issued pursuant to the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on June 9, 1972.

Douglas W. Toms
Administrator

37 F.R. 11973
June 16, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

(Docket No. 1–3; Notice 6)

This notice amends Motor Vehicle Safety Standard No. 122, *Motorcycle Brake Systems*, 49 CFR 571.122, to modify the master cylinder labeling and the wetting procedure for the water recovery test, effective January 1, 1974.

The amendment is based upon a notice published December 15, 1972, (37 F.R. 26739). The NHTSA proposed a change in the wording of the master cylinder reservoir label which would be identical to that specified in Motor Vehicle Safety Standard No. 105a, *Hydraulic Brake Systems* (37 F.R. 17970). In addition, a change in the wetting procedure for the water recovery test was proposed to require sequential immersion of the front and rear brake assemblies in lieu of simultaneous immersion.

The comments received generally supported the proposal. Some minor changes were requested, and Standard No. 122 is being amended accordingly. The reservoir labeling requirements have been modified in format in a manner consistent with recent amendments to Standard No. 105a (38 F.R. 13017). The height of the lettering has been retained at 3/32 of an inch. In order to avoid any misinterpretation, it is the NHTSA's intent to have the label completed with DOT and the grade of fluid designed for use in the system and not a manufacturer's brand name and number. If, however, silicone-based or petroleum-based fluids are appropriate for the system design specific fluids may be designated until a DOT grade and performance requirements have been specified. A contrast in color will be required only of printed labels. For this purpose, it has been decided that raised or lowered letters will provide a sufficient degree of legibility.

Finally, based on a comment made by the Japan Automobile Manufacturers Association, Inc. (JAMA), the wetting procedure for the water recovery test has been changed to extend the maximum testing time from 5 minutes to 7 minutes. JAMA stated that immersion of the rear brake first would still create engine stall problems if the water were allowed to enter the engine through the muffler(s) during the front brake assembly immersion period. The NHTSA feels strongly that the front brake should be immersed last due to potential instabilies created by a "grabbing" front brake. The extra time which has been allotted should be sufficient for manufacturers to provide protection for the exhaust system, thereby alleviating the problem of engine stall, and providing a measure of relief for those who considered the 5-minute period as excessively short.

In consideration of the foregoing, 49 CFR § 571.122, Motor Vehicle Safety Standard No. 122, is amended. . . .

Effective date: January 1, 1974.

(Secs. 103, 112, 119 Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 38 F.R. 12147)

Issued on May 30, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 14753
June 5, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

(Docket No. 74–16; Notice 2)

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distance values for the various tests should be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars.* As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.

The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor-driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unnecessary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown tha an effective date earlier than 180 days after issuance of the amendments is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on September 6, 1974.

James B. Gregory
Administrator

39 F.R. 32914
September 12, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

This notice corrects an error in paragraph S7.8.1 of 49 CFR 571.122, Motor Vehicle Safety Standard No. 122, *Motorcycle Brake Systems.*

On March 24, 1971 NHTSA proposed (36 FR 5516) as part of its anticipated motorcycle braking standard, that the final effectiveness test "repeat S7.6 including S7.3.1". Proposed S7.6 was the service brake system second effectiveness test. When Standard No. 122 was issued on March 9, 1972 (37 F.R. 5033) the proposal was adopted, in S7.8.1, that the final effectiveness test "Repeat S7.6 including S7.3.1". However, in the development of the final rule the test sequence was rearranged and the second effectiveness test had become S7.5. Through oversight, a corresponding change was not made in the final effectiveness test provisions. Accordingly the change is being made by this notice.

In consideration of the foregoing, paragraph S7.8.1 of 49 CFR § 571.122, Motor Vehicle Safety Standard No. 122 is revised to read "S7.8.1 *Service brake system.* Repeat S7.5 including S7.3.1".

Effective date: December 10, 1974. Because the notice corrects an error and creates no additional burden upon any person, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51)

Issued on December 4, 1974.

James B. Gregory
Administrator

39 F.R. 43075
December 10, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

(Docket No. 75–27; Notice 4)

This notice amends Standard No. 105–75, *Hydraulic Brake Systems*, and Standard No. 122, *Motorcycle Brake Systems*, to modify the means for establishing the frictional resistance of the surface on which stopping distance tests are conducted. A similar amendment is made to Part 575, *Consumer Information*, of Title 49 of the Code of Federal Regulations.

The National Highway Traffic Safety Administration (NHTSA) proposed the change in Standard No. 105–75 (49 CFR 571.105–75), Standard No. 121, *Air Brake Systems* (49 CFR 571.121), Standard No. 122 (49 CFR 571.122), and the Consumer Information Regulations (49 CFR 575.101) in response to a petition from British-Leyland Motors Limited (40 FR 45200, October 1, 1975). The existing test procedure in these regulations has specified use of the American Society for Testing and Materials (ASTM) E–274–65T procedure, using an ASTM E249 tire that is no longer manufactured.

Responses were received on the proposed ASTM change from White Motor Corporation (White), Mack Trucks, Inc. (Mack), Freightliner Corporation (Freightliner), Ford Motor Company (Ford), General Motors Corporation (GM), Chrysler Corporation (Chrysler), American Motors Corporation (AMC), and International Harvester (IH). The National Motor Vehicle Safety Advisory Council made no comment on the proposal.

Most commenters supported use of the new test procedure and tire, although they differed in recommendations for correlating the reading produced under the new procedure with that produced under the old procedure. Manufacturers are presently certifying compliance to brake standards on test surfaces with a satisfactory reading under the old procedure, and they should be able to continue testing and certifying compliance on the same surface without any increase in the severity of the tests. To accomplish this transition, the correlation in readings between the procedures has been determined, and the difference is reflected in a change of the dry surface value from "skid number" 75 to "skid number" 81.

Freightliner urged postponement of any action until it could be supported by "adequate and statistically reliable test data." AMC also recommended that the NHTSA do nothing "until the industry has had sufficient time to evaluate and verify the performance of the ASTM E501 test tire on all types of surfaces."

The change in procedure is prompted by the ASTM decision to utilize a new tire in ascertaining the frictional coefficient of test surfaces. As a result the old tire is no longer manufactured and only the new tire is available for skid number measurement. Manufacturers have conducted comparative tests with the new tire to determine the correlation between the readings given by the two tires. Neither Freightliner nor AMC submitted data showing that the agency's proposal to adjust the dry surface skid number upwards is unjustified. Only Mack submitted data and it supported the NHTSA and Federal Highway Administration test data that have been placed in the docket. General Motors considered the agency's proposed upward adjustment to be the maximum desirable based on its data. International Harvester, Chrysler, and Ford supported the change in dry surface skid number without qualification, and White suggested that a skid number of 85 be utilized. The agency finds that the AMC and Freightliner requests for further delay are unjustified.

Ford and Freightliner asked that the skid number for the lower coefficient (wet) surface also be adjusted. The agency's purpose in proposing the adjustment is limited to changes necessary to avoid a modification of the test surfaces or an increase in the severity of performance levels specified under the safety standards. The NHTSA earlier concluded that change of the wet surface specification was unnecessary, and no evidence has been supplied that would modify the earlier determination.

General Motors noted that an editorial change to the newer ASTM procedure does not appear in early publications of that procedure. To put all interested persons on notice of the editorial change, the NHTSA has included the change in its references to the ASTM E274–70 procedure.

Freightliner asserted that the newer procedure included modification of a formula that justified a larger upwards adjustment than that proposed by the agency. Actually, the modifications only corrected an error in the earlier formula which had no effect on the determination of frictional coefficient. Manufacturers either utilized a test trailer that obviated the need for calculations using the formula, or were aware of the error and corrected for it in their calculations. Thus the adjustment requested by Freightliner is not warranted.

In accordance with recently-enunciated Department of Transportation policy encouraging adequate analysis of the consequences of regulatory action (41 FR 16201, April 16, 1976), the agency herewith summarizes its evaluation of the economic and other consequences of this amendment on the public and private sectors, including possible loss of safety benefit. Because the new references to procedures and a test tire are expected to accord with existing practices, the amendment is judged not to have any significant impact on costs or benefits of the standards and consumer information item that are modified by the change.

Standard No. 121, *Air Brake Systems*, is presently subject to judicial review under § 105(a) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1394(a)). The U.S. Court of Appeals hearing the petition for review has indicated that it prefers to review the standard as it presently exists, without unnecessary amendment. To the degree possible, the agency is complying with that request and therefore, in the case of Standard No. 121, will delay the update of ASTM procedure until review is completed.

It is noted that this change in procedure for ascertaining the frictional resistance of the test surface does not invalidate data collected using the older procedure, and manufacturers can presumably certify on the basis of stopping distance tests conducted on surfaces measured by the old tire.

In consideration of the foregoing, amendments are made in Chapter V of Title 49, Code of Federal Regulations.

Effective date: June 14, 1976. Because the older test tire is no longer manufactured, and because the amendment of procedure and test tire is intended only to duplicate the existing procedure and tire, this amendment creates no additional requirements for any person, and an immediate effective date is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on June 8, 1976.

James B. Gregory
Administrator

41 F.R. 24592
June 17, 1976

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 122

(Docket No. 78–14; Notice 1)

Motorcycle Brake Systems

This notice amends Motor Vehicle Safety Standard No. 122 *Motorcycle Brake Systems*, to incorporate an interpretation, clarifying that the parking brake system test for a 3-wheeled motorcycle does not require that a vehicle be held on a 30 percent grade for 5 minutes if the limit of traction of its braked wheels is reached on a lower grade so that the vehicle begins to slide. This notice also amends the standard to clarify the conditions under which traction is determined. The action is occasioned by a recent interpretation of the agency provided in response to a petition for temporary exemption from Standard No. 122 by Daihatsu Motor Company whose B–20 vehicle's limit of traction was reached on a 20 percent grade (43 F.R. 36548). The amendment has no effect upon safety since it is a statement and clarification of an existing agency interpretation.

Effective date: As an interpretative rule, the amendment is effective upon publication in the Federal Register. October 10, 1978.

For further information contact:

Scott Shadle, Office of Rulemaking, National Highway Traffic Safety Administration, Washington, D.C. 20590 (202–426–2153).

Supplementary information: Paragraph S5.6 of 49 CFR 571.122, Motor Vehicle Safety Standard No. 122, requires in part that the parking brake system for a 3-wheeled motorcycle "be capable of holding the motorcycle, for 5 minutes in both forward and reverse directions, on a 30 percent grade. . . ." Recently the agency entertained a petition from Daihatsu Motor Company, Ltd. for a renewal of an exemption granted an electric motor-driven cycle in 1976 because of the inability of its braked wheels to hold it on a 30 percent grade in the reverse direction. The agency disposed of the petition by publishing an interpretation allowing Daihatsu to certify compliance with Standard No. 122, stating that the agency did not intended "to dictate design requirements such as center of gravity location and tire design mandating that the vehicle itself have a limit of traction sufficient to hold it on a grade that is 30 percent or greater when its wheels are braked." (43 F.R. 36548)

NHTSA has decided to incorporate this interpretation into Standard No. 122 by appropriate amendments to the parking brake system requirement (S5.6) and test procedures (S7.9). A similar limit-of-traction provision already exists with respect to the parking brake system requirements for hydraulically braked vehicles (paragraph S5.2.1 of 49 CFR 571.105).

This notice also amends Standard No. 122 to set forth the road surface on which traction is to be determined. As in the case of the parking brake test conditions in paragraph S6.9 of 49 CFR 571.105 and paragraph S5.6.2 of 59 CFR 571.121, Air Brake Systems, this notice specifies a surface of clean, dry, smooth portland cement concrete.

Because the amendment is an interpretative rule, under the Administrative Procedures Act it may be adopted without prior notice and public comment (5 U.S.C. 553(b)).

The principal authors of this amendment are Taylor Vinson of the Office of Chief Counsel and John Carson of the Office of Rulemaking.

In consideration of the foregoing, 49 CFR 571.122, Motor Vehicle Safety Standard No. 122 is amended. . . .

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on October 3, 1978.

Joan Claybrook
Administrator

43 F.R. 46547–46548
October 10, 1978

MOTOR VEHICLE SAFETY STANDARD NO. 122

Motorcycle Brake Systems

S1. Scope. This standard specifies performance requirements for motorcycle brake systems.

S2. Purpose. The purpose of the standard is to insure safe motorcycle braking performance under normal and emergency conditions.

S3. Application. This standard applies to motorcycles.

S4. Definitions.

"Braking interval" means the distance measured from the start of one brake application to the start of the next brake application.

"Initial brake temperature" means the temperature of the hottest service brake of the vehicle 0.2 miles before any brake application.

"Skid number" means the frictional resistance of a pavement measured in accordance with American Society for Testing and Materials (ASTM) Method E-274-70 (as revised July 1974) at 40 mph, omitting water delivery as specified in paragraphs 7.1 and 7.2 of that method.

"Stopping distance" means the distance traveled by a vehicle from the start of the brake application to the point where the vehicle stops.

"Split service brake system" means a brake system consisting of two or more subsystems actuated by a single control designed so that a leakage-type failure of a pressure component in a single subsystem (except structural failure of a housing that is common to all subsystems) shall not impair the operation of the other subsystem(s).

S.5 Requirements. Each motorcycle shall meet the following requirements under the conditions specified in S6, when tested according to the procedures and in the sequence specified in S7. Corresponding test procedures of S7 are indicated in parentheses. If a motorcycle is in-

TABLE I

STOPPING DISTANCES FOR EFFECTIVENESS, FADE AND PARTIAL SYSTEM TESTS

	Stopping distance, feet			
	Effectiveness tests			
Vehicle test speed m.p.h.	Preburnish effectiveness total system (S5.2.1) I	Preburnish effectiveness partial mechanical systems (S5.2.2) II	Effectiveness total system (S5.4) (S5.7.1) III	Effectiveness partial hydraulic systems (S5.7.2) IV
15	13	30	11	25
20	24	54	19	44
25	37	84	30	68
30	54	121	43	97
35	74	165	58	132
40	96	216	75	173
45	121	273	95	218
50	150	337	128	264
55	181	407	155	326
60	216	484	185	388
65	----------	----------	217	415
70	----------	----------	264	527
75	----------	----------	303	606
80	----------	----------	345	689
85	----------	----------	389	788
90	----------	----------	484	872
95	----------	----------	540	971
100	----------	----------	598	1076
105	----------	----------	659	1188
110	----------	----------	723	1302
115	----------	----------	791	1423
120	----------	----------	861	1549

TABLE II

BRAKE TEST SEQUENCE AND REQUIREMENTS

SEQUENCE L.C.	Test procedure	Requirements
1. Instrumentation check	S7.2	
2. First (Preburnish) effectivess test:		
(a) Service brake system	S7.3.1	S5.2.1
(b) Partial service brake system	S7.3.2	S5.2.2
3. Burnish procedure	S7.4	
4. Second effectiveness test	S7.5	S5.3
5. First fade and recovery test	S7.6	S5.4
6. Reburnish	S7.7	
7. Final effectiveness test:		
(a) Service brake system	S7.8.1	S5.5.1
(b) Partial service brake system	S7.8.2	S5.5.2
8. Parking brake test (three-wheeled motorcycles only)	S7.9	S5.6
9. Water recovery test	S7.10	S5.8
10. Design durability	S7.11	S5.8

capable of attaining a specified speed, its service brakes shall be capable of stopping the vehicle from the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile, within stoppping distances that do not exceed the stopping distances specified in Table 1.

S5.1 Required equipment—split service brake system. Each motorcycle shall have either a split service brake system or two independently actuated service brake systems.

S5.1.1 Mechanical service brake system. Failure of any component in a mechanical service brake system shall not result in a loss of braking ability in the other service brake system on the vehicle.

S5.1.2 Hydraulic service brake system. A leakage failure in a hydraulic service brake system shall not result in a loss of braking ability in the other service brake system on the vehicle. Each motorcycle equipped with a hydraulic brake system shall have the equipment specified in S5.1.2.1 and S5.1.2.2.

S5.1.2.1 Master cylinder reservoirs. Each master cylinder shall have a separate reservoir for each brake circuit, with each reservoir filler opening having its own cover, seal, and cover retention device. Each reservoir shall have a minimum capacity equivalent to one and one-half times the total fluid displacement resulting when all the wheel cylinders or caliper pistons serviced by the reservoir move from a new lining, fully retracted position to a fully worn, fully applied position. Where adjustment is a factor, the worst condition of adjustment shall be used for this measurement.

S5.1.2.2 [Reservoir labeling. Each motorcycle shall have a brake fluid warning statement that reads as follows, in letters at least 3/32 of an inch high:

"**WARNING:** Clean filler cap before removing. Use only ______ fluid from a sealed container." (Inserting the recommended type of brake fluid as specified in 49 CFR § 571.116, e.g. DOT 3) The lettering shall be—

(a) Permanently affixed, engraved or embossed;

(b) Located so as to be visible by direct view, either on or within 4 inches of the brake fluid reservoir filler plus or cap; and

(c) Of a color that contrasts with its background, if it is not engraved or embossed.

S5.1.3. Split service brake system. In addition to the equipment required by S5.1.2 each motorcycle equipped with a split service brake system shall have a failure indicator lamp as specified in S5.1.3.1.

S5.1.3.1 Failure indicator lamp.

(a) One or more electrically operated service brake system failure indicator lamps that is mounted in front of and in clear view of the driver, and that is activated—

(1) In the event of pressure failure in any part of the service brake system, other than a structural failure of either a brake master cylinder body in a split integral body type master cylinder system or a service brake system failure indicator body, before or upon application of not more than 20 pounds of pedal force upon the service brake.

(2) Without the application of pedal force, when the level of brake fluid in a master cylinder reservoir drops to less than the recommended safe level specified by the manufacturer or to less than one-half the fluid reservoir capacity, whichever is the greater.

(b) All failure indicator lamps shall be activated when the ignition switch is turned from the "off" to the "on" or to the "start" position.

(c) Except for the momentary activation required by S5.1.3.1(b), each indicator lamp, once activated, shall remain activated as long as the condition exists, whenever the ignition switch is in the "on" position. An indicator lamp activated when the ignition is turned to the "start" position shall be deactivated upon return of the switch to the "on" position unless a failure exists in the service brake system.

(d) Each indicator lamp shall have a red lens with the legend "Brake Failure" on or adjacent to it in letters not less than $\frac{3}{32}$ of an inch high that shall be legible to the driver in daylight when lighted.

S5.1.4 Parking Brake. Each three-wheeled motorcycle shall be equipped with a parking brake of a friction type with a solely mechanical means to retain engagement.

S5.1.5 Other requirements. The brake system shall be installed so that the lining thickness of drum brake shoes may be visually inspected, either directly or by use of a mirror without removing the drums, and so that disc brake friction lining thickness may be visually inspected without removing the pads.

S5.2 Service Brake System. First (preburnish) effectiveness.

S.5.2.1 Service brake system. The service brakes shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances which do not exceed the stopping distances specified in Column I of Table I (S7.3.1).

S5.2.2 Partial service brake system. Each independently actuated service brake system on each motorcycle shall be capable of stopping the motorcycle from 30 mph and 60 mph within stoping distances which do not exceed the stopping distances specified in Column II of Table I (S7.3.2).

S.5.3 Service brake system—second effectiveness. The service brakes shall be capable of stopping the motorcycle from 30 mph, 60 mph, 80 mph, and the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile if this speed is 95 mph or greater, within stopping distances that do not exceed the stopping distances specified in Column III of Table I (S7.5).

S5.4 Service brake system—fade and recovery.

These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S.5.4.1 Baseline check—minimum and maximum pedal forces. The pedal and lever forces used in establishing the fade baseline check average shall be within the limits specified in S6.10 (S7.6.1).

S5.4.2 Fade. Each motorcycle shall be capable of making 10 fade stops from 60 mph at not less than 15 fpsps for each stop (S7.6.2).

S5.4.3 Fade recovery. Each motorcycle shall be capable of making five recovery stops with a pedal force that does not exceed 90 pounds, and a hand lever force that does not exceed 55 pounds for any of the first four recovery stops and that for the fifth recovery stop is within plus 20 pounds and minus 10 pounds of the fade test baseline check average force (S7.6.3).

S5.5 Service brake system—final effectiveness. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S5.5.1 Service brake system. The service brakes shall be capable of stopping the motorcycle in a manner that complies with S5.3 (S7.8.1).

S5.5.2 Hydraulic service brake system—partial failure. In the event of a pressure component leakage failure, other than a structural failure of either a brake master cylinder body in a split integral body type master cylinder system or a service brake system failure indicator body, the remaining portion of the service brake system shall continue to operate and shall be capable of stopping the motorcycle from 30 mph and 60 mph within stopping distances that do not exceed the stopping distances specified in Column IV of Table I (S7.8.2).

S5.6 Parking brake system. The parking brake system shall be capable of holding the motorcycle stationary (to the limits of traction of the braked wheels), for 5 minutes, in both forward and reverse directions, on a 30 percent grade, with an applied force of not more than 90 pounds for a foot-operated system and 55 pounds for a hand-operated system (S7.9).

S5.7 Service brake system—water recovery.

S5.7.1 Baseline check. The pedal and lever forces used in establishing the water recovery baseline check average shall be within the limits specified in S6.10 (S7.10.1).

S5.7.2 Water recovery test. Each motorcycle shall be capable of making five recovery stops with a pedal force that does not exceed 90 pounds, and a hand lever force that does not exceed 55 pounds, for any of the first four recovery stops, and that for the fifth recovery stop is within plus 20 pounds and minus 10 pounds of the baseline check average force (S7.10.2).

S5.8 Service brake system design durability. Each motorcycle shall be capable of completing all braking requirements of S5 without detachment of brake linings from the shoes or pad, detachment or fracture of any brake system components, or leakage of fluid or lubricant at the wheel cyclinder and master cylinder reservoir cover, seal, or retention device (S7.11).

S6. Test conditions. The requirements of S5 shall be met under the following conditions. Where a range of conditions is specified, the motorcycle shall be capable of meeting the requirements at all points within the range.

S6.1 Vehicle weight. Motorcycle weight is unloaded vehicle weight plus 200 pounds (including driver and instrumentation), with the added weight distributed in the saddle or carrier if so equipped.

S6.2 Tire inflation pressure. Tire inflation pressure is the pressure recommended by the manufacturer for the vehicle weight specified in paragraph S6.1.

S6.3 Transmission. Unless otherwise specified, all stops are made with the clutch disengaged.

S6.4 Engine. Engine idle speed and ignition timing settings are according to the manufacturer's recommendations. If the vehicle is equipped with an adjustable engine speed governor, it is adjusted according to the manufacturer's recommendation.

S6.5 Ambient temperature. The ambient temperature is between 32° and 100° F.

S6.6 Wind velocity. The wind velocity is zero.

S6.7 Road surface. Road tests are conducted on level roadway having a skid number of 81. The roadway is 8 feet wide for two-wheeled motorcycles, and overall vehicle width plus 5 feet for three-wheeled motorcycles. The parking brake test surface is clean, dry, smooth portland cement concrete.

S6.8 Vehicle position. The motorcycle is aligned in the center of the roadway at the start of each brake application. Stops are made without any part of the motorcycle leaving the roadway and without lockup of any wheel.

S6.7 Thermocouples. The brake temperature is measured by plug-type thermocouples installed in the approximate center of the facing length and width of the most heavily loaded shoe or disc pad, one per brake, as shown in Figure 1.

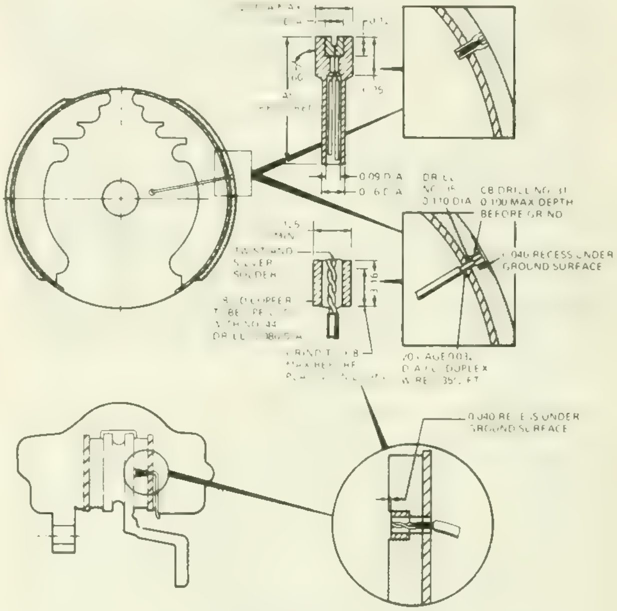
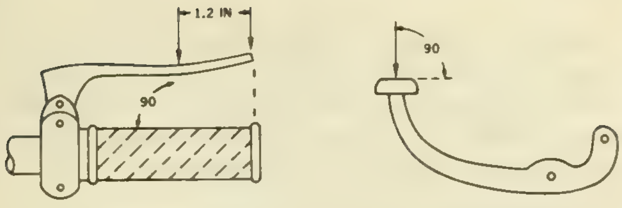


FIGURE 1

TYPICAL PLUG TYPE
THERMOCOUPLE INSTALLATIONS

S6.10 Brake actuation forces. Except for the requirements of the fifth recovery stop in S5.4.3 and S5.7.2 (S7.6.3 and S7.10.2) the hand lever force is not less than five and not more than 55 pounds and the foot pedal force is not less than 10 and not more than 90 pounds. The point of initial application of the lever forces is 1.2 inches from the end of the brake lever grip. The direction of the force is perpendicular to the handle grip on the plane along which the brake lever rotates, and the point of application of the pedal force is the center of the foot contact pad of the brake pedal. The direction of the force is perpendicular to the foot contact pad on the plane along which the brake pedal rotates, as shown in Figure 2.

FIG. 2 DIRECTION OF FORCE



(BRAKE LEVER) (BRAKE PEDAL)

S7. Test procedures and sequence. Each motorcycle shall be capable of meeting all the requirements of this standard when tested according to the procedures and in the sequence set forth below without replacing any brake system part, or making any adjustments to the brake system other than as permitted in S7.4. A motorcycle shall be deemed to comply with S5.2, S5.3 and S5.5 if at least one of the stops specified in S7.3, S7.5 and S7.8 is made within the stopping distances specified in Table I.

S7.1 Braking warming. If the initial brake temperature for the first stop in a test procedure (other than S7.10) has not been reached, heat the brakes to the initial brake temperature by making up to 10 stops from 30 mph at a deceleration of not more than 10 fpsps. On independently operated brake systems, the coldest brake shall be within 10° F of the hottest brake.

S7.2 Pretest instrumentation check. Conduct a general check of test instrumentation by making not more than 10 stops from a speed of not more than 30 mph at a deceleration of not more than 10 fpsps. If test instrument repair, replacement, or adjustment is necessary, make not more than 10 additional stops after such repair, replacement or adjustment.

S7.3 Service brake system - first (preburnished) effectiveness test.

S7.3.1 Service brake system. Make six stops from 30 mph and then six stops from 60 mph with an initial brake temperature between 130° F and 150° F.

S7.3.2 Partial service brake system. For a motorcycle with two independently actuated service brake systems, repeat S7.3.1 using each service brake system individually.

S7.4 Service brake system—burnish procedure. Burnish the brakes by making 200 stops from 30 mph at 12 fpsps. The braking interval shall be either the distance necessary to reduce the initial brake temperature to between 130° F and 150° F or 1 mile, whichever occurs first. Accelerate at maximum rate to 30 mph immediately after each stop and maintain that speed until making the next stop. After burnishing adjust the brakes in accordance with the manufacturer's recommendation.

S7.5 Service brake system—second effectiveness test. Repeat S7.3.1. Then, make four stops from 80 mph and four stops from the multiple of 5 mph that is 4 mph to 8 mph less than the speed attainable in 1 mile if that speed is 95 mph or greater.

S7.6 Service brake system—fade and recovery test. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S7.6.1 Baseline check stops. Make three stops from 30 mph at 10 to 11 fpsps for each stop. Compute the average of the maximum brake pedal forces and the maximum brake lever forces required for the three stops.

S7.6.2 Fade stops. Make 10 stops from 60 mph at not less than 15 fpsps for each stop. The initial brake temperature before the first brake application shall be between 130° F and 150° F. Initial brake temperatures before brake applications for subsequent stops shall be those occurring at the distance intervals. Attain the required deceleration as quickly as possible and maintain at least this rate for not less than three-fourths of the total stopping distance for each stop. The interval between the starts of service brake applications shall be 0.4 mile. Drive 1 mile at 30 mph after the last fade stop and immediately conduct the recovery test specified in S7.6.3.

S7.6.3 Recovery test. Make five stops from 30 mph at 10 to 11 fpsps for each stop. The braking interval shall not be more than 1 mile. Immediately after each stop accelerate at maximum rate to 30 mph and maintain that speed until making the next stop.

S7.7 Service brake system—reburnish. Repeat S7.4 except make 35 burnish stops instead of 200 stops. Brakes may be adjusted after reburnish if no tools are used. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S7.8 Service brake system—final effectiveness test. These requirements do not apply to a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less.

S7.8.1 Service brake system. Repeat S7.5 including S7.3.1.

S7.8.2 Partial service brake system test. Alter the service brake system on three-wheeled motorcycles to induce a complete loss of braking in any one subsystem. Determine the line pressure or pedal force necessary to cause the brake system failure indicator to operate. Make six stops from 30 mph and then six stops from 60 mph with an initial brake temperature between 130° F and 150° F. Repeat for each subsystem. Determine that the brake failure indicator is operating when the master cylinder fluid level is less than the level specified in S5.1.3.1(a) (2), and that it complies with S5.1.3.1(c). Check for proper operation with each reservoir in turn at a low level. Restore the service brake system to normal at completion of this test.

S7.9 Parking brake test. Starting with an initial brake temperature of not more than 150° F drive the motorcycle downhill on the 30 percent grade with the longitudinal axis of the motorcycle in the direction of the grade. Apply the service brakes with a force not exceeding 90 pounds to stop the motorcycle and place the transmission in neutral. Apply the parking brake by exerting a force not exceeding those specified in S5.6 Release the service brake and allow the motorcycle to remain at rest (to the limit of traction of the braked wheels) for 5 minutes. Repeat the test with the motorcycle parked in the reverse (uphill) position on the grade.

S7.10 Service brake system—water recovery test.

S7.10.1 Baseline check stops. Make three stops from 30 mph at 10 to 11 fpsps for each stop. Compute the average of the maximum brake pedal forces and of the maximum brake lever forces required for the three stops.

S7.10.2 Wet brake recovery stops. Completely immerse the rear brake assembly of the motorcycle in water for 2 minutes with the brake fully released. Next completely immerse the front brake assembly of the motorcycle in water for 2 minutes with the brake fully released. Perform the entire wetting procedure in not more than 7 minutes. Immediately after removal of the front brake from water, accelerate at a maximum rate of 30 mph without a brake application. Immediately upon reaching that speed make five stops, each from 30 mph at 10 to 11 fpsps for each stop. After each stop (except the last) accelerate the motorcycle immediately at a maximum rate to 30 mph and begin the next stop.

S7.11 Final inspection. Upon completion of all the tests inspect the brake system in an assembled condition, for compliance with the brake lining inspection requirements. Disassemble all brakes and inspect:

(a) The entire brake system for detachment or fracture of any component;

(b) Brake linings for detachment from the shoe or pad;

(c) Wheel cylinder, master cylinder, and axle seals for fluid or lubricant leakage;

(d) Master cylinder for reservoir capacity and retention device; and

(e) Master cylinder label for compliance with S5.1.2.2.

37 F.R. 5033
March 9, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

(Docket No. 70–26; Notice 3)

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 123 (49 CFR § 571.123) that establishes requirements for motorcycle controls and displays. A notice of proposed rulemaking on this subject was published on November 6, 1970 (35 F.R. 17117).

The National Highway Traffic Safety Administration estimates that over 3,000 accidents may be avoided annually by specifying a uniform standard for motorcycle controls and displays. As this agency commented in the prior notice: "Controls and displays link the operator and the machine, and if there is confusion as to their location, interpretation, or operation, a dangerous situation may result. A cyclist, especially the novice and the cyclist who has changed from one make of machine to another, must not hesitate when confronted with an emergency." The purpose of the new standard is to minimize operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

The basic operational requirement of Standard No. 123 is that handlebar-mounted controls be operable throughout their full range without the operator removing his hand from the handgrip. Standard No. ~~123 requires all motorcycles~~ to have a supplemental engine stop control, operable from the right handlebar, intended for use in emergency situations. Notice of this requirement was proposed in Notice 2 to Docket No. 69–20, *Accelerator Control Systems* (35 F.R. 15241). Standard No. 123 also requires that if any of ten other specified equipment items are provided on a motorcycle, the location and method of operation of the applicable control shall be standardized. These items are: manual clutch or integrated clutch and gear change, foot-operated gear change, headlamp upper-lower beam control, horn, turn signal lamps, ignition, manual fuel shutoff control, twist-grip throttle, front wheel brake, and rear wheel brakes. Motorcycles that are designed and sold exclusively for use by law enforcement agencies are excluded from Standard No. 123, as the configuration of certain controls on such vehicles, necessary for law enforcement purposes, differs from that required by the new standard. Proposals applicable to the instrument illumination intensity control, the electric starter, and the kick starter have not been adopted as insufficient correlation with motor vehicle safety has been found for these items.

As noted below, some of the location and operational requirements that were proposed have not been adopted in the following instances Otherwise, the location and operation of controls are required as proposed.

1. *Foot-operated gear change.* The likelihood of inadvertent engagement of reverse gear has been found to be so slight that a means to prohibit it has not been found necessary. Further, no requirement has been specified for location of neutral gear. Under Proposal A, neutral would have occurred lowest in the gear sequence. Proposal A was not adopted because of the likelihood of overshooting low gear when downshifting, thus contributing to a possible loss of control. In Proposal B, the transmission would be put into neutral by a rearward motion of the operator's heel on a control device separate from the shift lever. This method was not adopted since it appears to have no inherent safety advantages over any other means of finding neutral. The intent of Proposal B was to ensure that neutral can reliably be selected when desired without being selected inadvertently when not

desired. The conventional neutral light may serve as an aid to such shifting; however, any system which requires eye movements away from the road merely to shift gears cannot be considered to be an adjunct to safety.

The present standard does not impose specific requirements for ease of locating the gear position, or for protection against inadvertent shifting into neutral. However, the Administration considers these to be desirable objectives and will consider amending the standard if it appears necessary to do so.

2. *Headlamp control.* Because heavy gloves are needed for safe riding, only a simple "up for higher beam, down for lower beam" requirement has been adopted.

3. *Turn signal lamps.* Because turn signal lamps are not a required item of motorcycle equipment until January 1, 1973, and the industry is experimenting with various controls, Standard No. 123 specifies only that the turn signal lamp control be located on the handlebars.

4. *Ignition:* Because of the adoption of the requirement that motorcycles be equipped with a supplemental engine stop control on the right handlebar, the need to specify a location and method of operation for the ignition has diminished. Accordingly, the sole ignition control requirement is that the "off" position be counterclockwise from all other positions.

5. *Manual fuel shutoff control.* The requirements adopted do not apply to automatic fuel shutoff controls. No location for a manual control is specified. Based upon comments, revisions have been made in the direction of valve operation.

Substantial modifications have been made as well in the display proposals. Because of the limited range within which displays can be located on a motorcycle, it has been determined that no specific location requirements are necessary. Illumination of the neutral position and the speedometer has been deemed essential; the proposal that a green lamp indicate neutral position has been adopted, and the speedometer must be illuminated whenever the headlamp is activated. Because turn signals and upper beam indicators are covered in Standard No. 108, they have been omitted from the display illumination requirements of Standard No. 123.

Proposals for control identification, stands, and passenger foot-rests have been adopted substantially as proposed. Since operating instructions are invariably provided with motorcycles, the NHTSA has not adopted the proposal covering them.

Effective date: September 1, 1974. Because of the leadtime necessary for preparation for production, it is found, for good cause shown, that an effective date later than one year after the issue date is in the public interest.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by adding § 571.123, Motor Vehicle Safety Standard No. 123, *Motorcycle Controls and Displays*, as set forth below.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on April 4, 1972.

Douglas W. Toms
Administrator

37 F.R. 7207
April 12, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

This notice responds to petitions for reconsideration of Motor Vehicle Safety Standard No. 123 (49 CFR § 571.123) and amends the standard in minor respects.

Motor Vehicle Safety Standard No. 123, establishing requirements for the location, operation, identification, and illumination of motorcycle controls and displays, effective September 1, 1974, was published on April 12, 1972 (37 F.R. 7207). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the rule were filed by Japan Automobile Manufacturers Asociation, Inc. ("JAMA"), Kawasaki Motors Corp. (Kawasaki), and Cushman Motors ("Cushman") through counsel. In response to these petitions the standard is being revised in minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Manual fuel shutoff valve.* Standard No. 123 requires that the manual fuel shutoff control point downward when in the "on" position, forward in the "off" position, and upward to supply fuel from a reserve source if one is provided.

JAMA has requested that the configuration found on most Japanese motorcycles be adopted: "off" with the control position to the left, "reserve" to the right, and "on" downward. JAMA's request was originally made in response to the notice proposing control positions for the shut-off valve, and was considered at that time. JAMA's petition is denied. The NHTSA has determined that the control should be standardized by requiring its operation along a longitudinal rather than a transverse axis. In this location there is a greater likelihood that in the event of a crash, the control will be carried by inertia to the off position, thereby shutting off the fuel.

JAMA also asked for an interpretation of the words "control pointing" asking if the words mean the direction of a non-operational pointer indicating the off-position, or the direction of the control end operated by the fingers. "Control pointing" means the direction of the control end operated by the fingers. To eliminate this possible ambiguity, the word "pointing" is deleted from the entry in Table I.

2. *Headlamp control.* The NHTSA requires, in Standard No. 123, that the upper headlamp beam be activated with an upward motion of the beam control, and the lower beam by a downward motion. Kawasaki has asked that these positions be reversed. It reasons that when the left thumb is under the handlebar, the lower beam control can be more quickly activated with an upward movement of the thumb, rather than by raising the thumb above the switch and then depressing it. The Administration denies Kawasaki's request, as it is considered contrary to good human factors engineering. Control mechanisms which are used for increasing the output of a system are generally designed to be switched upward for higher intensity.

3. *Speedometer graduations.* Both JAMA and Kawasaki have petitioned for reconsideration of the requirement that major and minor graduations and numerals appear at the 10 and 5 mph intervals respectively, alleging that operator confusion could be caused by a clutter of numerals and graduations at 5 mph intervals. The NHTSA considers these petitions to have merit and is amending Standard No. 123, to require only minor graduations at the 5 mph intervals.

4. *Control identification.* JAMA has petitioned for an amendment of Table 3 to eliminate identification of some controls and to identify only control positions. The petition also requested abbreviation of the identification presently required. JAMA alleges difficulty in providing all the identification marks due to lack of

space around the handlebar. It argues that an individual operator will not mistake one equipment item for another on different cycles when all controls are uniformly located as specified by Standard No. 123.

The Administration denies JAMA's petition. Labeling control positions without identifying the control itself could confuse the novice motorcyclist and may contribute to traffic hazards. During the initial learning stage the cyclist will not be able to identify controls by their required location. Further, there are no common abbreviations with universal acceptance for the controls mentioned, *viz.*, choke, starter, horn, and neutral indicator.

JAMA also requested a clarification as to whether control identification must be indicated in capital letters. The answer is no: use of upper or lower case lettering is at the manufacturer's discretion. Kawasaki asked whether it is permissible to add information to the tachometer identification indicating that it registers thousands of revolutions per minute. The marking requirements of the standard are minimum requirements only, and the NHTSA has no objection to further identification of this nature for the tachometer.

5. *Three-wheeled motorcycles.* Cushman manufactures three-wheeled motorcycles. It alleged that many of the requirements of Standard No. 123 are incompatible with the configuration of its vehicle. It requested that Standard No. 123 be amended to exclude three-wheeled motorcycles that are designed to achieve a maximum speed no greater than 40 mph. Cushman raised a number of specific objections concerning control location and operation, identification, and displays. In view of the disposition of Cushman's petition it is not necessary to discuss the objections in detail.

Cushman's petition is denied for the following reasons. Petitioner manufactures two types of three-wheeled vehicles, identical except for steering configuration. One type employs handlebars, the other a steering wheel. Its sales literature indicates that most models manufactured with handlebars are intended for industrial applications on private property, and are not intended to be licensed as motor vehicles for use on the public roads. The remaining models manufactured with handlebars are intended for police use. Standard No. 123 does not apply to this type of vehicle. Cushman's models intended for street use are equipped with the steering wheel as standard equipment. The standard does not apply to motorcycles with steering wheels. A denial of Cushman's petition means only that, after September 1, 1974, three-wheeled motorcycles for street use may not be sold with the handlebar option.

6. *Miscellaneous.* A typographical error is corrected concerning the integrated clutch and gear change.

In consideration of the foregoing, 49 CFR § 571.123, Motor Vehicle Safety Standard No. 123, is revised . . . . *Effective date:* September 1, 1974, the same effective date as the standard as previously issued (37 F.R. 7207).

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on August 22, 1972.

Douglas W. Toms
Administrator

37 F.R. 17474
August 29, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 123

(Docket No. 74-16; Notice 2)

This notice amends 49 CFR 571.108, 571.122, and 571.123, Motor Vehicle Safety Standards Nos. 108, 122, and 123, to modify current requirements that apply to motor-driven cycles.

Interested persons have been afforded an opportunity to participate in the making of the amendment by a notice of proposed rulemaking published on April 12, 1974 (39 F.R. 13287) and due consideration has been given to all comments received in response to the notice, insofar as they relate to matters within its scope.

The prior notice responded to petitions by Cycles Peugeot, Ateliers de la Motobecane, and S.I.N.F.A.C., manufacturers, and Bermuda Bikes, Inc., and Robert F. Smith, retail dealers. The notice proposed that a motor-driven cycle whose speed attainable in 1 mile is 30 mph or less need not be equipped with turn signal lamps, and may be equipped with a stop lamp with one-half the photometric output otherwise required. Braking fade and recovery requirements also would not apply to these low-speed vehicles. Maximum stopping distances values for the various tests would be added for test speeds of 25, 20, and 15 mph. Finally, a braking control on the left handlebar would be a permissible alternative to the required right foot braking control.

The comments received addressed both areas of performance covered in the proposal, and areas where no standards currently exist, such as motors, transmissions, pedals, and a request for exemption from Standard No. 119, *Tires for Vehicles Other Than Passenger Cars.* As these latter comments cover matters beyond the scope of the proposal, this notice does not discuss them. The agency, however, has been formally petitioned for rulemaking covering transmissions and Standard No. 119, and will respond to the petitioners in the near future.

The decision by NHTSA not to establish a separate category of vehicle was objected to by some commenters. In support of their request, they argued that the majority of motor-driven cycles have engines producing only 1.5 to 2 horsepower, and consequent low maximum speeds, reducing the need for forward lighting that is currently required of these vehicles. Petitioners submitted no data justifying their request. The NHTSA, however, intends to study the matter of forward lighting for low-powered two-wheeled vehicles through a research contract with the University of Michigan. When the contract is completed the agency will then decide whether further rulemaking is warranted.

The proposal distinguished motor-driven cycles on the basis of maximum speed attainable in 1 mile, rather than on horsepower, and the value selected, 30 mph, fell within the maximum (40 mph) and minimum (20 mph) suggested by commenters. The NHTSA has concluded therefore that the distinction should be adopted as proposed.

Some manufacturers requested restrictive controls on power plant output, apparently in fear that the engine of a vehicle with a top speed of 30 mph or less could be modified to exceed that speed, and therefore cause the vehicle to no longer comply with the Federal standards. This agency has not found that course of action to be practicable. The various ways to modify a vehicle after purchase cannot be anticipated or prevented at the manufacturer level. On the other hand, the great majority of consumers use their vehicles in the form in which they were purchased. The motor-driven cycle category itself contains a limitation of 5 horsepower, which will be applicable to the special lighting modifications. In the NHTSA's judgment, modifications by consumers and the consequent equipment requirements should continue to be regulated at the State level.

The fact that the agency took no action to propose a reduction in existing headlamp requirements for motor-driven cycles was criticized by several manufacturers as unduly restrictive because of the low speed and power output of their vehicles. No justification has been shown for such a change. Motor-driven cycles therefore must have sufficient generating and/or battery capacity to meet the headlamp requirements.

There was no substantive objection to the actual proposals for omission of turn signals, reduced stop lamp photometrics, relief from brake fade requirements, inclusion of maximum allowable stopping distances for low speeds, and rear brake control placement. Accordingly, the standards are being amended in the manner proposed.

Standard No. 122 is also being amended to delete the final effectiveness test (S5.5) for those motor-driven cycles excused from the fade and recovery requirements. The purpose of the final effectiveness test is to check the stopping ability of the vehicle after the fade and recovery tests. Since this requirement has been eliminated for motor-driven cycles of low top-speed, the final effectiveness test is redundant, and an unnecessary duplication of the second effectiveness test. No safety purpose is served by its retention. Language is also added to the fade and recovery and final effectiveness test procedures (S7.6, S7.7, and S7.8), making it clear that they do not apply to motor-driven cycles whose speed attainable in 1 mile is 30 mph or less.

In consideration of the foregoing, 49 CFR Part 571 is amended . . . .

Effective date: October 14, 1974. As the amendments allow new options for compliance, relieve restrictions, and impose no additional burdens on regulated persons, it is found for good cause shown that an effective date earlier than 180 days after issuance of the amendments is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on September 6, 1974.

James B. Gregory
Administrator

39 F.R. 32914
September 12, 1974

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 123

Federal Motor Vehicle Safety Standards; Motorcycle Controls and Displays

[Docket No. 80-05; Notice 2]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 123, *Motorcycle Controls and Displays*, to allow use of "r/min" as an alternative to "R.p.m." to indicate revolutions per minutes to the tachometer. This action is taken pursuant to a grant of two petitions for rulemaking. A notice of proposed rulemaking was published on Arpil 10, 1980 (45 FR 24515). The primary benefit of the amendment is that it will allow use of metric units for identification that are widely used by other countries.

EFFECTIVE DATE: September 20, 1983.

SUPPLEMENTARY INFORMATION: The Japan Automobile Manufactuers Association, Inc. and the Motorcycle Industry Council, Inc. petitioned for rulemaking to amend Federal Motor Vehicle Safety Standard No. 123, *Motorcycle Controls and Displays*, to provide the option of using "r/min" as well as the existing "R.p.m." letters on the tachometer to indicate revolutions per minute.

According to petitioners, such an amendment would allow metric units for identifications that are widely accepted internationally. Under the metric system the unit describing rotational frequency is "r/min", recognized by both the International Standards Organization and the U.S. Society of Automotive Engineers. Such an amendment would not affect safety and would be in the interest of international standards harmonization.

The agency granted the petitions and on April 10, 1980, proposed alternative amendments (45 FR 24515). The first, effective upon publication, would have allowed optional use of "R.p.m." or "r/min". The second would have allowed "r/min" immediately upon publication" and required its exclusive use eventually.

All comments to the notice of proposed rulemaking supported the first alternative, and the standard is being amended to allow use of either "R.p.m." or "r/min" as an acceptable means of identification of revolutions per minute. It should be understood that this requirement is inclusive of minute variations from the letters indicated, such as use of capital letters or omission of periods, and that such usage or omission will not be deemed failures to comply with Standard No. 123. Because the amendment imposes no additional burden on any persons and contributes to the international harmonization of vehicle standards, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance of this amendment is in the public interest.

The agency's examination has shown that this rulemaking action is not a major regulation under Executive Order 12291 "Improving Government Regulations," or a significant regulation under the Department's regulatory policies and procedures, and that a regulatory impact analysis is not required. Further, the cost impacts will be so minimal that preparation of a full regulatory evaluation is not warranted. Amendment of the standard will impose no additional manufacturer requirements but will allow producers flexibility to adopt tachometers that are now precluded by the current requirements of Standard No. 123. The cost savings resulting from taking advantage of that flexibility would be insubstantial.

The agency has also considered the impacts of this amendment in relation to the Regulatory Flexibility Act. I certify that amending Standard No. 123 would not have a significant economic effect on a substantial number of small entities. Accordingly, no initial regulatory flexibility analysis has been prepared. Based on available information, the agency believes no manufacturers of motorcycles are small businesses as that term is defined for purposes of the Flexibility Act. Small organizations and governmental jurisdictions which purchase fleets of motor vehicles would probably not be significantly affected. The difference in cost of vehicles equipped with current tachometers and those permitted by the amendment would be insubstantial at most.

In consideration of the foregoing, the letters "R.p.m." in Column 2 of Table 3 of 49 CFR 571.123, Motor Vehicle Safety Standard No. 123, are revised to read "R.p.m. or r/min".

Issued on September 14, 1983.

Diane K. Steed
Deputy Administrator

48 FR 42819
September 20, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

[Docket No. 83-13; Notice 2]

ACTION: Final rule

SUMMARY: The purpose of this notice is to amend Safety Standard No. 123, *Motorcycle Controls and Displays*, to allow greater flexibility in mounting the manual fuel control shut-off valve. This action is taken pursuant to a grant of a petition for rulemaking and a notice of proposed rulemaking published on September 6, 1983 (48 FR 40286). Its primary benefit is that it will relieve a current design restriction which is demed no longer necessary for motor vehicle safety.

EFFECTIVE DATE: October 8, 1984.

SUPPLEMENTARY INFORMATION: Table 1 of Standard No. 123 specifies that the manual fuel shut-off control have the following modes of operation: "off", with the control forward, "on", with the control downward, and "reserve" (if provided), with the control upward. No requirements are specified for the location of the control. However, Standard No. 123 has generally been interpreted as requiring control rotation around a transverse axis.

In March 1981 Bajaj Auto Ltd. asked NHTSA for an "exemption" from this requirement in order to mount its fuel shut-off control so that it could be rotated around a longitudinal axis. In establishing the original operational modes, NHTSA had justified them by stating that in the event of a crash there was a greater likelihood that the control would be carried forward by inertia to the "off" position, thereby shutting off the fuel. In Bajaj's opinion, this effect would be unlikely except in the most severe collisions because of the low weight of the operating control lever, and the tightness of the control valve necessary to guard against inadvertent closure of the control in normal operation. After deliberation, and its own informal investigation, the agency concurred with Bajaj's reasoning and decided to treat Bajaj's request as a petition for rulemaking. Bajaj was informed of this decision in 1982.

The agency tentatively decided that motor vehicle safety through standardization of controls is best served in this instance by retaining the relationships of the control positions to each other while allowing the manufacturer to place the control so that it may operate in its required positions around either a longitudinal or transverse axis. It was proposed that when the control is rotated around a longitudinal axis, the "off" position shall be "horizontal" with the other positions downward for "on" and upward for "reserve on". In the horizontal position, the control can be pointing either to the right or left.

Comments were received from American Honda Motor Co., Japan Automobile Manufacturer's Association (JAMA), Kawasaki Motors Corp., USA, and BMW Bikers of Metropolitan Washington. The manufacturers supported the proposal, and requested further amendments responsive to rotation about a vertical axis. BMW Bikers urged the agency to consider the potential hazards that might result were the control relocated so far inboard as to be difficult to reach and manipulate.

More specifically, a request was made that Standard No. 123 be amended to allow future designs of manual shut-off valves that would be rotational around a vertical axis. Kawasaki recommended that rotation be allowed around any axis. It was also recommended that the rotational axis be allowed to vary by plus or minus 30 degrees, as the exact axis of rotation (zero degrees) may be difficult to achieve because of the shape of the fuel tank and other vehicle components.

The agency has reviewed these requests and believes that they have merit as relief of design restrictions. However, the proposal did not ask for comments on the advisability of rotation around a vertical axis, or on a 30 degree tolerance. Therefore, the standard is being amended in the manner specified in the proposal.

With respect to the concern expressed by BMW Bikers, it is true that mounting the control around the longitudinal axis might make it awkward to reach and difficult to operate, but the agency does not believe that any manufacturer will change its current design in a manner that would make it less appealing to the consumer. The new location does represent a convenient location for motorscooters such as are manufactured by the petitioner.

NHTSA has considered this rule and has determined that it is not major within the meaning of Executive Order 12291 "Federal Regulation" or significant under Department of Transportation regulatory policies and procedures, and that neither a regulatory impact analysis nor a full regulatory evaluation is required. The rule imposes no additional requirements but permits manufacturers greater flexibility in locating the control concerned.

NHTSA has analyzed this rule for the purposes of the National Environmental Policy Act. The rule will have no effect on the human environment since the weight and quantity of materials used in the manufacture of motorcycles is not changed. No impact on safety is anticipated.

The agency has also considered the impacts of this rule in relation to the Regulatory Flexibility Act. I certify that this rule will not have a significant economic impact on a substantial number of small entities, and no initial regulatory flexibility analysis has been prepared. Manufacturers of motorcycles, those affected by the rule, are generally not small businesses within the meaning of the Regulatory Flexibility Act. Finally, small organizations and governmental jurisdictions will not be significantly affected since the price of new motorcycles will be minimally impacted.

Because the amendment relieves a restriction, is optional in nature, and furthers international harmonization, it is hereby found for good cause shown that an effective date earlier than 180 days after issuance is in the public interest, and the amendment is effective 30 days after publication in the *Federal Register.*

In consideration of the foregoing, the operation requirements for the manual fuel shut-off control (item 7) in Column 3 of Table 1 of 49 CFR 571.123, Motor Vehicle Safety Standard No. 123, are revised to read as follows:

"on"—Control downward.

"off "—Control forward (if control rotates around a transverse axis) or Horizontal—Left or Right (if control rotates around a longitudinal axis).

"reserve on"—(if provided) Control upward.

(Secs. 103, 119, Pub. L. 87-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on August 31, 1984.

Diane K. Steed
Administrator

49 FR 35380
September 7, 1984

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays
[Docket No. 83-14; Notice 2]

ACTION: Final rule.

SUMMARY: Standard No. 123, *Motorcycle Controls and Displays,* specifies requirements for the location, operation, identification and illumination of controls and displays in two- and three-wheeled motor vehicles. This notice amends Standard No. 123 by adding symbols as an option to the words which are presently required to identify motorcycle controls and displays. This amendment brings the standard into harmony with latest documents promulgated by the International Standard Organization. The changes should reduce compliance costs by promoting international harmonization. This action results in part from a petition for rulemaking submitted by BMW of North America.

A notice of proposed rulemaking on this subject was published on September 6, 1983 (48 FR 40282).

EFFECTIVE DATE: October 11, 1984.

SUPPLEMENTARY INFORMATION: Standard No. 123, *Motorcycle Controls and Displays,* specifies requirements for the location, operation, identification and illumination of controls and displays in motorcycles. The purpose of the standard is to ensure the accessibility and visibility of controls and displays and to facilitate their quick and proper identification and selection by a driver in order to reduce the safety hazards caused by the diversion of the driver's attention from the driving task, and by mistakes in selecting controls.

Among its requirements, Standard No. 123 specifies the use of certain words for the identification of several controls and displays. The standard is silent as to the use of symbols in addition to or in place of words. BMW of North America petitioned for rulemaking to amend the standard so that symbols may be used. Its petition was granted on August 30, 1983, and a notice of proposed rulemaking implementing the grant was published on September 6, 1983 (48 FR 40282).

The symbols proposed were those developed by the International Standards Organization (ISO). Certain ISO symbols have also been adopted by the United Nations Economic Commission for Europe (ECE) and the European Economic Community (EEC).

Costs would be reduced by facilitating international harmonization. Manufacturers which produce vehicles for sale in both this nation and abroad would not have to produce separate dashboards or controls and displays to meet conflicting identification requirements.

NHTSA proposed that Table 3 be amended by adding a new column containing ISO symbols for supplemental engine stop, manual choke, electric starter, headlamp upper-lower beam control, horn, turn signals, neutral indicator, upper beam indicator, and fuel tank shut-off valve. These symbols could be used in addition to, or in lieu of, the words presently required. A footnote was added to clarify that the framed area of certain symbols may be filled in.

There are issues associated with the use of symbols for which NHTSA was especially interested in soliciting comments.

The first of these issues was the number and type of symbols that can be used to greatest effect. The ISO is a nonregulatory body. The European regulatory body (ECE) has additional, and in some instances different, symbols. There are potential safety and cost savings advantages to reaching consensus on the most effective symbols. In NHTSA's opinion, symbols should identify only the most important controls and displays. The proposal listed symbols covering only 9 controls and displays included in Table 3; the ISO standard for motorcycles (ISO 6727) has 22. NHTSA solicited comments on the number of those symbols that should be required or permitted, with attention to the question whether a proliferation of symbols contributes to confusion rather than providing clarification.

Another issue was whether, if the required words are used, a manufacturer should be allowed to supplement those words with symbols which it has developed on its own. Some of the ISO-approved symbols may have an unclear relationship to the function concerned, and in these instances manufacturers may have developed a more relevant symbol.

A further issue was the permissibility of deviation from exact replication of a symbol, such as use of a light symbol with four rays rather than the five depicted. The agency proposed that the symbols specified shall be "substantially in the form" shown in the new table to cover minor errors that have an inconsequential relationship to motor vehicle safety. NHTSA was interested in comments on this issue as well. A final issue was whether all symbols, including those in Standard No. 101, should be placed in a separate regulation that is not a Federal motor vehicle safety standard.

Comments on the notice were received from Japan Automobile Manufacturers Association (JAMA), Kawasaki Motors Corp. U.S.A., Yamaha Motor Corp. U.S.A., Chrysler Corp., General Motors Corp., Suzuki Motor Co. Ltd., and BMW Bikers of Washington.

The use of ISO symbols was unanimously supported, Kawasaki commenting that this is a step towards harmonization of American requirements with those of other nations. Several commenters suggested, however, that the proposed revision of Table 3 appeared redundant in requiring use of words to identify control operation (Column 4) if a symbol were also used. The agency agrees with this comment and the final rule allows several options for control and control position function identification: by only the symbol (Column 3), by wording (Column 2 and Column 4), or by both symbol and wording (Column 2, Column 3, and Column 4). In addition, a manufacturer may provide symbols and words where none are shown in the Columns. Although expressed in rewritten form, previous specifications of paragraph S5.2.3 continue to apply: permission to spell out control identification abbreviations, placement of identification on or adjacent to the control, position, and appearance of identification to the operator in an upright position.

Kawasaki pointed out to the agency that most modern motorcycles do not rely on a "choke" device but incorporate an enrichening circuit in the carburator. It asked that amendments be made to Columns 1 and 2 to reflect that fact, allowing "Mixture Enrichment" in addition to "Manual Choke", and "Enrichener" as well as "Choke". While the agency believes that most operators will continue to use the word "choke" to describe the system that enriches the fuel-air mixture, the agency has decided to extend the terminology associated with this control to acknowledge the existence of alternative technology to aid in cold starting. Table 3, Column 1 will therefore contain the equipment designation "Manual Choke or Mixture Enrichment" and Table 3, Column 2 will contain the control and display identification "Choke or Enrichener".

NHTSA's request for comments on the issue of the number and types of symbols that could be used to greatest effect was addressed only inferentially with the comment that the agency had not proposed use of all ISO symbols for motorcycles. NHTSA had also asked whether if the required words were used, a manufacturer should be allowed to supplement those words with symbols other than those of the ISO which may have an unclear relationship to the function concerned. Those who commented felt that only ISO symbols should be permitted, and some asked that the entire list be provided. The amendment that is the subject of this notice allows a manufacturer to apply its own symbols for ignition, tachometer, and speedometer as none are specified for these displays and controls in Column 3. It was brought to the agency's attention that the electric starter symbol may not be the one currently approved by the ISO. The agency has been able to substantiate that the symbol proposed (adopted by the ISO in 1981 and also the symbol specified by ECE Regulation No. 60) is the current ISO symbol and the final rule thus adopts the symbol of the proposal.

Manufacturers supported the concept of the permissibility of minor deviations from exact replication of the ISO symbols, which may be occasioned by space limitations on small vehicles such as motorcycles. Accordingly, the standard is amended as proposed, requiring only that a symbol be "substantially in the form" shown in Column 3.

Finally, there was general agreement that symbols in Standard No. 123 and Standard No. 101, *Controls and Displays,* should be joined in a separate regulation that is not a Federal motor vehicle safety standard. The agency shall consider these comments in future rulemaking.

The agency has assessed the economic and other impacts of these amendments and determined that the amendment is neither a major rule within the meaning of Executive Order 12291 nor a significant rule under the Department of Transportation's regulatory policies and procedures. Further, the agency concludes that the economic and other consequences of these amendments are so minimal as not to require preparation of a full regulatory evaluation. The impact is minimal because the cost difference between using words and symbols is negligible and because use of symbols instead of words is optional.

In consideration of the foregoing, the following amendments are made in §571.123 and Chapter V of Title 49, Code of Federal Regulations:

1. Section S5.2.3 is revised to read:

§571.123 Standard No. 123; motorcycle controls and displays.

S5.2.3 *Control and display identification.* If an item of equipment in Table 3, Column 1, is provided, the item and its operational function shall be identified by:

(a) A symbol substantially in the form shown in Column 3; or

(b) Wording shown in both Column 2 and Column 4; or

(c) A symbol substantially in the form shown in Column 3 and wording shown in both Column 2 and Column 4.

The abbreviations "M.P.H.", "r/min", "Hi", "Lo", "L", "R", and "Res" appearing in Column 2 and Column 4 may be spelled in full. Symbols and words may be provided for equipment items where none are shown in Column 2, Column 3, and Column 4. Any identification provided shall be placed on or adjacent to the control or display position, and shall appear upright to the operator.

* * * * *

2. Table 3 is revised to read:

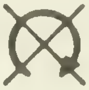
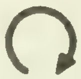
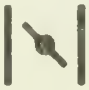
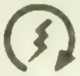
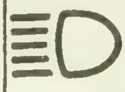
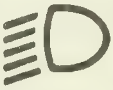
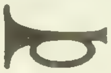
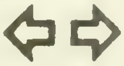
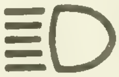
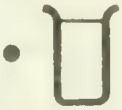
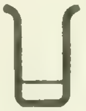
Issued on August 31, 1984

Diane K. Steed
Administrator

49 FR 35503
September 10, 1984

Table 3

Motorcycle Control and Display Identification Requirements

No.	Column 1 Equipment	Column 2 Control and Display Identification Word	Column 3 Control and Display Identification Symbol	Column 4 Identification at Appropriate Position of Control or Display
1	Ignition	Ignition		Off
2	Supplemental Engine Stop (Off, Run)	Engine Stop	 	Off, Run
3	Manual Choke or Mixture Enrichment	Choke or Enrichener		
4	Electric Starter			Start[1]
5	Headlamp Upper-Lower Beam Control	Lights	 [2]  [2]	Hi, Lo
6	Horn	Horn		
7	Turn Signal	Turn	 [2] [3]	L, R
8	Speedometer	M.P.H.		M.P.H.[4]
9	Neutral Indicator	Neutral	N	
10	Upper Beam Indicator	High Beam	 [2]	
11	Tachometer	R.P.M. or r/min.		
12	Fuel Tank Shutoff Valve (Off, On, Res.)	Fuel	 [2]  [2]	Off, On, Res.

[1] Required only if electric starter is separate from ignition switch.

[2] Framed areas may be filled.

[3] The pair of arrows is a single symbol. When the indicators for left and right turn operate independently however, the two arrows will be considered separate symbols and may be spaced accordingly.

[4] M.P.H. increase in a clockwise direction. Major graduations and numerals appear at 10 mph intervals, minor graduations at the 5 mph intervals. (37 F.R. 17474—August 29, 1972. Effective: 9/1/74)

MOTOR VEHICLE SAFETY STANDARD NO. 123

Motorcycle Controls and Displays

(Docket No. 70-26; Notice 3)

S1. Scope. This standard specifies requirements for the location, operation, identification, and illumination of motorcycle controls and displays, and requirements for motorcycle stands and footrests.

S2. Purpose. The purpose of this standard is to minimize accidents caused by operator error in responding to the motoring environment, by standardizing certain motorcycle controls and displays.

S3. Application. This standard applies to motorcycles equipped with handlebars, except for motorcycles that are designed, and sold exclusively, for use by law enforcement agencies.

S4. Definitions. "Clockwise" and "counterclockwise" mean opposing directions of rotation around following axes, as applicable:

(a) The operational axis of the ignition control, viewed from in front of the ignition lock opening;

(b) The axis of the right handlebar on which the twist-grip throttle is located, viewed from the end of that handlebar;

(c) The axis perpendicular to the center of the speedometer, viewed from the operator's normal eye position.

S5. Requirements.

S5.1 Each motorcycle shall be equipped with a supplemental engine stop control, located and operable as specified in Table I.

S5.2 Each motorcycle to which this standard applies shall meet the following requirements:

S5.2.1 Control location and operation. If any item of equipment listed in Table 1, Column 1, is provided, the control for such item shall be located as specified in Column 2, and operable as specified in Column 3. Each control located on a right handlebar shall be operable by the operator's right hand throughout its full range without removal of the operator's right hand from the throttle. Each control located on a left handlebar shall be operable by the operator's left hand throughout its full range without removal of the operator's left hand from the handgrip. If a motorcycle with an automatic clutch is equipped with a supplemental rear brake control, the control shall be located on the left handlebar. If a motorcycle is equipped with self-proportioning or anti-lock braking devices utilizing a single control for front and rear brakes, the control shall be located and operable in the same manner as a rear brake control.

S5.2.2 Display illumination and operation. If an item of equipment listed in Table 2, Column 1, is provided, the display for such item shall be visible to a seated operator under daylight conditions, shall illuminate as specified in column 2, and shall operate as specified in Column 3.

S5.2.3 Control and display identification. [If an item of equipment listed in Table 3, Column 1, is provided, the item and its operational function shall be identified by;

(a) A symbol substantially in the form shown in Column 3; or

(b) Wording shown in both Column 2 and Column 4; or

(c) A symbol substantially in the form shown in Column 3 and wording shown in both Column 2 and Column 4.

The abbreviations "M.P.H.", "r/min", "Hi", "Lo", "L", "R", and "Res" appearing in Column 2 and Column 4 may be spelled in full. Symbols and words may be provided for equipment items where none are shown in Column 2, Column 3, and Column 4. Any identification provided shall be placed on or adjacent to the control or display position, and shall appear upright to the operator. (49 F.R. 35503—September 10, 1984. Effective: October 11, 1984)]

Control positions shall be identified as specified in Column 3, to signify the function performed at that setting. The abbreviations used in Columns 2 and 3 are minimum requirements and appropriate words may be spelled in full. Identification shall appear to the operator in an upright position.

Functional identification need not be provided for equipment items with no entry in Column 3.

S5.2.4 Stands. A stand shall fold rearward and upward if it contacts the ground when the motorcycle is moving forward.

S5.2.5 Footrests. Footrests shall be provided for each designated seating position. Each footrest for a passenger other than an operator shall fold rearward and upward when not in use.

TABLE 1.—Motorcycle Control Location and Operation Requirements

Equipment Control	Location	Operation
Column 1	*Column 2*	*Column 3*
1. Manual clutch or integrated clutch and gear change	Left handlebar	Squeeze to disengage clutch.
2. Foot operated gear change	Left foot control	An upward motion of the operator's toe shift transmission toward lower numerical gear ratios (commonly referred to as "higher gears"), and a downward motion toward higher numerical gear ratios (commonly referred to as "lower gears"). If three or more gears are provided it shall not be possible to shift from the highest gear directly to the lowest gear, or vice versa.
3. Headlamp upper-lower beam	Left handlebar	Up for upper beam, down for lower beam. If combined with the headlight on-off switch, means shall be provided to prevent inadvertent actuation of the "off" function.
4. Horn	Left handlebar	Push to activate.
5. Turn signal lamps	Handlebars	
6. Ignition		"Off—counterclockwise from other positions.
7. Manual fuel shutoff control		["On"—Control downward. "Off—Control forward, (if control rotates around a transverse axis) or Horizontal—Left or Right (if control rotates around a longitudinal axis). "Reserve On"—(if provided) Control upward. (49 F.R. 35380—September 7, 1984. Effective: October 8, 1984)]
8. Twist-grip throttle	Right handlebar	Self-closing to idle in a clockwise direction after release of hand.
9. Supplemental engine stop	Right handlebar	
10. Front wheel brake	Right handlebar	Squeeze to engage.
11. Rear wheel brakes	Right foot control [1] Left handlebar permissible for motor-driven cycles.	Depress to engage.

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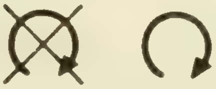
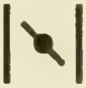
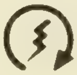
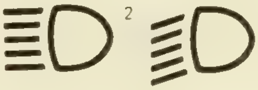
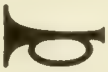
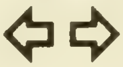
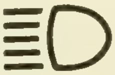
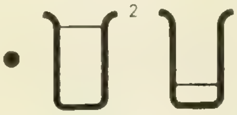
[1] See S5.2.1 for requirements for vehicles with a single control for front and rear brakes, and with a supplemental rear brake control.

TABLE 2.—Motorcycle Display Illumination and Operation Requirements

Display	Illumination	Operation
Column 1	*Column 2*	*Column 3*
1. Speedometer	Yes	The display is illuminated whenever the headlamp is activated.
2. Neutral indication	Green display lamp	The display lamp illuminates when the gear selector is in neutral position.

Table 3
Motorcycle Control and Display Identification Requirements

No.	Column 1 Equipment	Column 2 Control and Display Identification Word	[Column 3 Control and Display Identification Symbol	Column 4 Identification at Appropriate Position of Control or Display
1	Ignition	Ignition		Off
2	Supplemental Engine Stop (Off, Run)	Engine Stop		Off, Run
3	Manual Choke [or Mixture Enrichment]	Choke [or Enrichener]		
4	Electric Starter			Start[1]
5	Headlamp Upper-Lower Beam Control	Lights	 [2] [2]	Hi, Lo
6	Horn	Horn		
7	Turn Signal	Turn	 [2] [3]	L, R
8	Speedometer	M.P.H.		M.P.H.[4]
9	Neutral Indicator	Neutral	N	
10	Upper Beam Indicator	High Beam	 [2]	
11	Tachometer	R.P.M.		
12	Fuel Tank Shutoff Valve [(Off, On, Res.)]	Fuel	 [2] [2]	Off, On, Res.]

[1] Required only if electric starter is separate from ignition switch.

[2] Framed areas may be filled.

[3] The pair of arrows is a single symbol. When the indicators for left and right turn operate independently however, the two arrows will be considered separate symbols and may be spaced accordingly.

[4] M.P.H. increase in a clockwise direction. Major graduations and numerals appear at 10 mph intervals, minor graduations at the 5 mph intervals. (49 F.R. 35380—September 7, 1984. Effective: October 8, 1984)

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 124

Accelerator Control Systems

(Docket No. 69–20; Notice 3)

The purpose of this notice is to establish a new motor vehicle safety standard that specifies requirements for accelerator control systems of passenger cars, multi-purpose passenger vehicles, trucks and buses.

A notice of proposed rulemaking on this subject was published September 30, 1970 (35 F.R. 15241). The majority of comments received supported the proposal. There were some objections and questions, which have been considered in formulating the final rule.

In the previous notice, the Administrator indicated the importance of this standard in reducing the number of accidents caused by runaway engines. Since 1966, sixty recall campaigns totalling over 2.9 million vehicles have involved this problem. Three percent of all complaints in the Administration's files have reported malfunctioning accelerator or carburetor systems. Because the ability of a driver to control his vehicle is directly related to the proper functioning of the accelerator control system, it is essential that this system perform as expected, especially when the driver removes the actuating force. Therefore, the standard sets requirements to ensure the reliability of accelerator control systems over a wide range of driving conditions. Each system must include two independent sources of energy (such as springs) which shall return the throttle to idle upon the removal of the actuating force. In the case of breakage or disconnection in the accelerator system, the throttle shall return to idle either at the time of breakage or at the removal of the actuating force.

The latter requirement differs from the NPRM, which mandated a return to idle only when the actuating force was removed. Industry comments raised valid objections to this requirement. In some cases, if a breakage occurred and the system had to keep operating until the driver took his foot off the pedal, a complicated system of sensors would have to be built into the throttle which would activate the redundant energy sources precisely at the time of actual removal. Such a device would be too expensive for its possible safety benefit, since the incidence of accidents from engine loss of power are minimal when compared with runaway overspeed statistics. Manufacturers, therefore, have been given the option to use either return-to-idle mode.

Although many comments suggested modification of the temperature range, the ambient temperature levels in the NPRM are retained. A review of meteorological data indicates that these figures conform to possible driving conditions in various areas of the United States.

There are four other proposed requirements in the NPRM that are not included in the final rule. These are the 300-pound force requirement, the coverage of automatic speed control systems, the freedom-of-movement requirement, and the coverage of motorcycles.

Several commenters raised objections to the 300-pound overforce, and some asked for a lesser force than 300 pounds. It was found on review that the safety benefits of an overforce test has not been demonstrated sufficiently and the requirement has been dropped from the rule.

The rule does not contain requirements for automatic speed control devices. It was found that although nine recall campaigns involving 61,176 vehicles have concerned these devices, no relationship to accelerator overspeed accidents could be established from automatic speed controls. Of the 540 multi-disciplinary accident reports that were studied in formulating the final rule, none mentioned the automatic system. The requirements of the NPRM reiterated SAE recommendations that are already used by manufacturers.

The "freedom-of-movement" paragraph raised the objections of subjectivity and difficulty of implementation. Enforcement through compliance testing would lead to controversy over the imprecise meaning of "necessary chafing." It appears that to comply with the final rule, the accelerator system will have to be free of excessive and unsafe rubbing and friction.

The decision to eliminate motorcycles from the applicability of this standard is based on the fact that motorcycles are so different in design from the other vehicles covered that definitions and failure modes are dissimilar. Also, a safety standard specifically tailored for motorcycle controls (Docket 70-26) will be issued this year.

This issue of the Federal Register contains a Notice of Proposed Rule-making to amend Standard No. 124 (37 F.R. 7108). The proposal is that the two independent sources of energy would return the throttle idle within one half second after the removal of the actuating force or a breakage or disconnection in the accelerator control system.

This standard is directed at the hazard caused by a failure in the accelerator control system. Those engine overspeed incidents caused by other failure modes such as broken or worn engine mounts are not addressed by this rulemaking action. The NHTSA is presently developing performance requirements for safety under other failure modes.

In consideration of the foregoing, Part 571 of Title 49, Code of Federal Regulations, is amended by adding a new § 571.124, Motor Vehicle Safety Standard No. 124, as set forth below.

Effective Date: September 1, 1973.

Because of the development work and preparation for production that this standard will require, it is found that an effective date later than 1 year from the date of issuance is in the public interest. Accordingly, the standard is effective September 1, 1973.

This rule is issued under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on March 31, 1972.

Douglas W. Toms
Administrator

37 F.R. 7097
April 8, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 124

Accelerator Control Systems

(Docket No. 69–20;Notice 5)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 124 (49 C.F.R. 571.124), and to amend the standard to specify time requirements for the return of a vehicle's throttle to the idle position.

On April 8, 1972 (37 F.R. 7097), Motor Vehicle Safety Standard No. 124 was published, establishing requirements for accelerator control systems, effective September 1, 1973. Simultaneously, a notice was published (37 F.R. 7108) proposing that when the driver removes the actuating force from the accelerator control or in the event of a breakage or disconnection in the accelerator control system, the return to idle position shall occur within one-half second.

I. Pursuant to 49 C.F.R. 553.35, petitions for reconsideration of the rule were filed by Alfa Romeo, American Automobile Association (AAA), American Motors Corporation, Chrysler Corporation, Diamond Reo Trucks, Incorporated, Ford Motor Company, General Motors Corporation (GM), International Harvester Company, Japan Automobile Manufacturers Association (JAMA), Jeep Corporation, Jesse R. Hollins, Mack Trucks, Incorporated, MacMillan Engineering Lab, Motor Vehicle Manufacturers Association of the United States, Incorporated, (MVMA) (formerly Automobile Manufacturers Association, Incorporated), and Rolls-Royce Motors Limited.

Favorable consideration has been granted to some of these petitions, and accordingly, the standard is being amended in some minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

GM and Ford requested that vehicles over 10,000 pounds GVWR be exempted from the standard, while Mack and Diamond Reo requested an exemption for vehicles of 26,000 and 25,000 pounds or more GVWR, respectively. Petitioners argued that since these vehicles are driven by professionally trained drivers, are equipped with engine governors, have a horsepower to weight ratio that does not mandate a fail-safe requirement, and have not been the subject of a defect notification campaign, there is no need for the rule's applicability.

The NHTSA denies petitioners' request. Available information shows that accidents resulting from throttle failure do not occur only among the less experienced drivers, nor are they diminished by the presence of engine governors or by changes in the horsepower to weight ratio. Further, these vehicles have been the subject of defect notification campaigns, and accident reports submitted to the Bureau of Motor Carrier Safety disclose that an average of two accidents occur per month in which the cause is attributed to "overspeed incidents", indicating the type of failure the standard is designed to eliminate.

Additionally, GM stated that the standard's test requirements are not justified by the possible additional safety benefit that may accrue. They argued that the only method by which it could assure compliance is by immersion of the entire vehicle in a low temperature cell. GM stated that sufficient facilities to conduct such tests on all their vehicles are not available, and even if they were, the test burden is impracticable because of the complications of determining where over the length of the vehicle the ambient temperature measurements should be taken.

The NHTSA does not view Standard No. 124 as a qualification procedure by which a manufacturer can assure himself or his customers that the vehicle now has a fail-safe system. The rule is intended to provide a minimum performance requirement, and does not mandate that assurances of being in compliance must be made by immersing the total vehicle in a low temperature cell. Assurances of compliance may come from other procedures.

Several petitioners provided data showing that it is a common practice in the automobile industry to include the "throttle lever" or "actuating lever" as part of the carburetor. They ask that these devices be interpreted to be part of the fuel metering device so as to afford them greater freedom of design.

The NHTSA agrees with this interpretation. The "throttle lever" or "actuating lever" as described by the petitioners is a component of the fuel metering device.

Additionally, several petitioners requested that the definition of "idle position" be amended to take into consideration delay units or "dash pots" which are frequently used on idle settings to slow the return of the throttle during its last few degrees of rotation to prevent stalling and excessive exhaust emissions. In essence, petitioners request that the return to idle time be measured to the point at which the throttle first comes in contact with the delay unit or "dash pot." This request is in accordance with the intended meaning of the standard. For clarification, the NHTSA is amending the definition of "idle position" to be the specific point of throttle closure at which the throttle first comes in contact with an engine idle speed control device.

Mack and Alfa Romeo petitioned that "hand throttles" and throttle positioners be specifically excluded from the definition of "idle position". Petitioners stated that in the event such a device is used a return to the preset throttle position occurs upon release of the driver-operated accelerator control system. This request is granted. If a driver chooses to raise the lowest engine speed threshold by the use of a throttle positioning device, the throttle should return to that new position within the same time requirements specified in section S5.3. Accordingly, the NHTSA is amending the definition of "idle position" to provide for the use of throttle positioners.

JAMA requested that the engine warm-up provisions for cold temperatures be clarified, so that it would be possible to conduct tests "after warming up the engine according to the manufacturer's recommendation." Standard No. 124 is silent as to engine warm-up, and states only "when the engine is running" as a condition for the test. Although the advantages of following the manufacturer's warm-up procedures are recognized, it is felt that in most instances the driving public does not adhere to those recommendations. Therefore, to afford the driving public as broad a coverage of the rule as is possible, JAMA's petition is denied.

AAA and Chrysler petitioned for an amendment of the ambient temperature range. AAA urged that since colder temperatures are commonplace in Alaska and that hotter temperatures are used by vehicle manufacturers to test fuel system control devices, a more severe temperature range should be established. Chrysler stated that the minus 40 degree figure exceeds automotive practice by 30 degrees and asked that a performance level of minus 10 degrees be established.

In determining the temperature limits to be used, the NHTSA attempted to provide motor vehicle safety without establishing impracticable design goals. Weather data discloses that although temperatures of minus 40 degrees Fahrenheit are encountered in many parts of the United States, colder temperatures are unusual. For this reason, minus 40 degrees Fahrenheit was determined to be the lowest temperature consistent with the needs of motor vehicle safety. Conversely, vehicle operations in temperatures exceeding 125 degrees Fahrenheit are also unusual. Accordingly, it was determined that temperature limits of minus 40 degrees to plus 125 degrees Fahrenheit will allow for most climatic conditions encountered in the United States. The petitions are therefore denied.

Several petitioners asked for an interpretation of the phrase "The system shall include at least two sources of energy" in section S5.1 and whether it includes energy sources attached to the fuel metering service. Petitioners stated that a strict interpretation would cause excessive design restrictions. If a return spring attached to the fuel metering device is capable of returning the throttle to its idle position after the failure of other energy sources, it meets the intent of the standard and should not be disallowed. Accordingly, paragraph S5.1 is amended by replacing the phrase "The system shall include at least two sources of energy" with "There shall be at least two sources of energy".

JAMA asked whether, if a system includes three or more springs, each spring must be independently capable of returning the throttle to the idle position. They argued that a system could still remain adequately fail-safe as long as the other springs operating together can meet the requirements. The intent of paragraph S5.1 is to eliminate the driver's dependence on a single accelerator return spring. The NHTSA concurs with JAMA's comments and is amending paragraph S5.1 to make it clear that independent capability of return springs is not required if remaining energy sources are collectively capable of returning the throttle to the idle position.

The standard as issued required that the throttle return to the idle position "whenever any element of the accelerator control system becomes disconnected or broken." Several petitioners seek an interpretation of this wording. GM suggested that a disconnection or breakage within the driver-operated accelerator control system was the only failure mode addressed by the standard. Ford asked whether the requirement was intended to cover failures caused by bending, twisting, jamming, or introduction of foreign matter. The NHTSA's intent is to assure safety under conditions of a single failure due only to a severing or disconnection in the accelerator control system. To clarify this interpretation, the NHTSA is changing the word "breakage" to "severance" in paragraph S1, and the word "broken" to "severed" in the first sentence of paragraph S5.2. Further, the phrase "whenever any element of the accelerator control system" is changed to "whenever any one component of the accelerator control system" for purposes of clarification.

Ford and JAMA petitioned that the effective date of the standard be delayed one year. Petitioners stated that additional time was necessary to allow for the creation and confirmation of design changes and to resolve any conflicts with emission control requirements.

The NHTSA considers the complexity of the requirements of standard No. 124 to be minimal and has granted relief on several issues effecting design time, and therefore sees no justification for delaying the effective date of the standard. The petitions are denied.

II. On April 8, 1972 (37 F.R. 7108) a notice was published proposing that when the driver removes the actuating force from the accelerator control or in the event of a breakage or disconnection in the accelerator control system, the return to idle position shall occur within one-half second. Available information indicates that in most instances the time for driver reaction from the accelerator control pedal to the brake is approximately one-half second, and this time was chosen for the proposal. In response to the notice, many commentors objected to the one-half second proposal and stated that it did not adequately take into consideration the viscous nature of lubricants in extremely cold temperatures and the impracticability of this time requirement for the very large systems in heavy trucks and buses. The NHTSA recognizes the validity of these objections, and allowances have accordingly been made for extreme low temperature. An idle time of 3 seconds is established for any vehicle tested or conditioned in ambient air of 0 degrees Fahrenheit or colder.

Large systems, similar to those used on rear-engine buses, have sufficient mass and friction to preclude the possibility of compliance with the one-half second proposal, unless very high spring forces, which would require large changes in pedal forces, are used. Several commentators stated that tests for conformity with the proposed requirements show that compliance would be possible if the maximum time were extended to 2 seconds. The NHTSA finds these comments to have merit, and 2 seconds is established as the maximum return time for vehicles with a GVWR over 10,000 pounds.

Many comments pertaining to passenger car systems stated that the one-half second proposed is too severe a requirement. One commentor stated that extra time will be required if one of the return energy sources fails. It was pointed out that precedent for an extra allowance can be found in the dual braking system requirement, which allows added distance for stopping when half the system has failed. The accelerator standard, however, does not deal with a mechanism with the same redundancy as the braking system and it is felt that the maximum time selected should allow for the possibility of one energy source failing.

There are a large number of models and engine sizes in the passenger car industry, and a large number of variety of accelerator control systems are designed and built each year. One commentor suggested that ". . . a one second time limit would considerably increase design options . . ." and "presently accepted pedal feel can be retained. . . ." Accordingly, one second has been decided upon as having the qualities of providing a reasonable maximum time for compliance testing of vehicles of 10,000 pounds or less GVWR at temperatures above 0 degrees Fahrenheit.

In response to questions raised by several petitioners, "ambient temperature is defined as the surrounding air temperature, at a distance such that it is not significantly affected by heat from the vehicle under test. The definition contrasts the ambient temperature, intended to simulate a general outdoor temperature, from temperatures under the hood or otherwise in close proximity to the vehicle.

In consideration of the foregoing, 49 CFR 571.124, Motor Vehicle Safety Standard No. 124, is revised to read as set forth below.

Effective date: September 1, 1973.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on September 20, 1972.

Douglas W. Toms
Administrator

37 F.R. 20033
September 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 124

Accelerator Control Systems

(Docket No. 69-20; Notice 6)

The purpose of this notice is to respond to petitions for rulemaking to amend and petitions for reconsideration of Motor Vehicle Safety Standard No. 124 (49 CFR 571.124).

On September 23, 1972 (37 F.R. 20033), Motor Vehicle Safety Standard No. 124 was published specifying time requirements for the return of a vehicle's throttle to the idle position. Pursuant to 49 CFR 553.35, petitions for reconsideration were filed by Japan Automobile Manufacturers Association, Inc. (JAMA) and Volkswagen of America, Inc. Additionally, pursuant to 49 CFR 553.31, a petition for rulemaking to amend the standard was filed by the Ford Motor Company.

Favorable consideration has been granted to some of the requests and accordingly, the standard is being amended in some minor respects. The Administrator has declined to grant requested relief from other requirements of the standard.

Volkswagen requested that the test requirements for cold temperatures be clarified, in order to determine whether it is possible to use supplementary starting devices and to "pump" the accelerator control pedal during and after the presoak and prior to the test. The advantages of using supplementary devices and warmup procedures are recognized, but in many instances, the driving public either does not adhere to the manufacturer's recommended warmup procedures or uses other procedures. The intent of the standard is to afford the driving public as broad a coverage of the rule as is possible, by simulating as closely as possible actual conditions. Accordingly, for purposes of testing compliance the engine may be started by the use of any supplementary starting devices and procedures except those which would induce the vehicle into motion by the application of an external force.

Volkswagen also asked the NHTSA to define the speed at which the accelerator pedal is "to be released" to mark the beginning of the test determining the return of the throttle to idle position. The agency's intent is to provide protection in the variety of situations that may be encountered on the road. The vehicle, therefore, must be capable of meeting the requirements no matter how rapidly or slowly the driver's foot is lifted from the pedal. The actuating force actually is not "removed" from the pedal until the foot is no longer in contact with it, so the measured time period for throttle return does not begin until the instant when the foot leaves the pedal.

Further, Volkswagen asked the NHTSA to define a "running engine." Volkswagen stated that during cold testing an engine could start, run for approximately 6 seconds, and then stall. Volkswagen theorized that it would be possible to have an accelerator system fail the test requirements during this 6-second interval, although the engine would be incapable of causing a safety problem. The phrase "engine running" defines a condition without which throttle return to idle position has no significance. The intent of the standard is to prevent any safety problems caused by faulty throttle return over a broad range of operating circumstances and temperature conditions. The condition of a running engine, regardless of torque produced, is a clearly definable point at which a safety problem could begin to occur. Therefore, the vehicle must be capable of meeting the requirements whenever the engine is rotating without the application of any external force.

JAMA requested that the time requirements for maximum return to idle position when tested in temperatures between 0 and minus 40 degrees

Fahrenheit be applied "only when there is no failure of the source of energy and no disconnection or severance of components." JAMA stated that in order for a system to meet the time requirements of the rule during cold testing, the "required pedal effort would be increased to an extent that would not be acceptable to the ordinary driver." In its earlier comments to Notice 3, (37 F.R. 7097), JAMA stated that if each energy source was independently required to return the throttle to idle within the specified time requirements, increased pedal forces would be necessary. In response to this comment and to allow a manufacturer design freedom, the standard was amended by Notice 5, (37 F.R. 20033), to specify that independent capability of energy sources to return the throttle to idle position was not required. The amendment also gave an additional time allowance for return to idle position for vehicles tested or conditioned in cold temperatures. Based on these factors and on the comments received from other manufacturers, this agency's position is that the standard provides enough latitude for a manufacturer to feasibly meet the pedal force requirements and the time requirements for return to idle, even if there is a failure of one source of energy or a severance or disconnection occurs. The petition is therefore denied.

Ford pointed out that under the requirements section, S5.1 states that, "There shall be at least two sources of energy" and that this seemed at variance with the intent expressed in the preamble to Notice 5 that energy sources do not have to be contained in the accelerator control system. To further clarify the intent expressed in Notice 5, the phrase in S.5 "The vehicle shall be equipped with a driver-operated accelerator control system that meets the following requirements" is changed to "The vehicle shall meet the following requirements . . . ."

Ford also asked for a clarification of the word "failure" in S5.1. Ford stated that the word was ambiguous in that it would allow for abnormal operating conditions outside the scope of the standard's intent to assure safety under conditions of a single failure due to a severance or disconnection in the system. To clarify the standard's intent, the phrase in S5.1 which states that, "In the event of failure of one source of energy the remaining source or sources shall be capable of returning the throttle" is changed to "In the event of failure of one source of energy by a single severance or disconnection, the throttle shall return . . . ."

Further, in the first sentence of S5.2 the word "becomes" is changed to "is" and the phrase "at a single point" is added to the end of the sentence to clarify this meaning.

In consideration of the foregoing, 49 CFR 571.124, Motor Vehicle Safety Standard No. 124, is revised to read as set forth below.

Effective date: September 1, 1973.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 24, 1973.

Douglas W. Toms
Administrator

38 F.R. 2980
January 31, 1973

MOTOR VEHICLE SAFETY STANDARD NO. 124
ACCELERATOR CONTROL SYSTEMS

(Docket No. 69-20; Notice 3)

S1. Scope. This standard establishes requirements for the return of a vehicle's throttle to the idle position when the driver removes the actuating force from the accelerator control, or in the event of a severance or disconnection in the accelerator control system.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries resulting from engine overspeed caused by malfunctions in the accelerator control system.

S3. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks, and buses.

S4. Definitions.

S4.1 "Driver-operated accelerator control system" means all vehicle components, except the fuel metering device, that regulate engine speed in direct response to movement of the driver-operated control and that return the throttle to the idle position upon release of the actuating force.

"Fuel metering device" means the carburetor, or in the case of certain engines, the fuel injector, fuel distributor, or fuel injection pump.

"Throttle" means the component of the fuel metering device that connects to the driver-operated accelerator control system and that by input from the driver-operated accelerator control system controls the engine speed.

"Idle position" means the position of the throttle at which it first comes in contact with an engine idle speed control appropriate for existing conditions according to the manufacturer's recommendations. These conditions include, but are not limited to, engine speed adjustments for cold engine, air conditioning, and emission control, and the use of throttle setting devices.

"Ambient temperature" means the surrounding air temperature, at a distance such that it is not significantly affected by heat from the vehicle under test.

S4.2 In the case of vehicles powered by electric motors, the word "throttle" and "idle" refer to the motor speed controller and motor shutdown, respectively.

S5. Requirements. The vehicle shall meet the following requirements when the engine is running under any load condition, and at any ambient temperature between minus 40° Fahrenheit and plus 125° Fahrenheit after 12 hours of conditioning at any temperature within that range.

S5.1 There shall be at least two sources of energy capable of returning the throttle to the idle position within the time limit specified by S5.3 from any accelerator position or speed whenever the driver removes the opposing actuating force. In the event of failure of one source of energy by a single severance or disconnection, the throttle shall return to the idle position within the time limits specified by S5.3, from any accelerator position or speed whenever the driver removes the opposing actuating force.

S5.2 The throttle shall return to the idle position from any accelerator position or any speed of which the engine is capable whenever any one component of the accelerator control system is disconnected or severed at a single point. The return to idle shall occur within the time limit specified by S5.3, measured either from the time of severance or disconnection or from the first removal of the opposing actuating force by the driver.

S5.3 Except as provided below, maximum time to return to idle position shall be 1 second for vehicles of 10,000 pounds or less GVWR, and 2 seconds for vehicles of more than 10,000 pounds GVWR. Maximum time to return to idle position shall be 3 seconds for any vehicle that is exposed to ambient air at 0 to minus 40 degrees Fahrenheit during the test or for any portion of the 12-hour conditioning period.

37 F.R. 7097
April 8, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard No. 125 (49 CFR § 571.125) that would establish shape, size, and performance requirements for warning devices that do not have self-contained energy sources. The devices are carried in motor vehicles and are erected to alert approaching motorists to the presence of a disabled vehicle.

A notice of proposed rulemaking on this subject was published on November 11, 1970 (36 F.R. 17350). The comments received in response to the notice have been considered in this issuance of a final rule.

As noted in the proposed rule, the standard will supplement the vehicular hazard warning signal lamps required by F.M.V.S.S. No. 108, *Lamps, Reflective Devices, and Associated Equipment*, in minimizing the likelihood of rear end collisions between oncoming traffic and disabled vehicles.

The standard is issued as an equipment standard and establishes requirements only for warning devices which do not have self-contained energy sources. Because provision of warning devices in new vehicles is optional, the instructions regarding the number of devices to be used are recommendations, rather than requirements, and the storage location requirement is deleted.

The standard requires that the device be bidirectional, lowers the minimum length of the triangle legs, and increases the permissible deviation from a vertical plane for the triangle when the device is placed on the road. It reduces the required minimum candlepower of the red reflective material and raises the luminance requirement for the orange fluorescent material. It also adds definitions of "reflex reflective," deletes one of the two definitions of the colors "red" and "orange," and deletes one of the two reflectivity requirements. With respect to the conditioning requirements, the standard lowers the high temperature requirement.

Several of the comments submitted by foreign motor vehicle manufacturers stated that the warning device should conform to the recommendations of international advisory groups. The Economic Commission of Europe (E.C.E.), a United Nations-sponsored council of which twenty-six nations, including the United States, are members, is in the process of developing specifications for warning triangles to be ratified by national governments. The NHTSA has adopted most of the proposed E.C.E. requirements with the exception of the minimum candlepower requirement for wide angle positioning of the device. The NHTSA has determined that a lower minimum candlepower than that required by the E.C.E. provides adequate protection and is a more realistic reflection of the state of the art.

Comments from the domestic automobile industry objecting to mandatory provision of warning devices stated that available information does not justify the additional cost of supplying them in new vehicles. The NHTSA has concluded that it is necessary to collect further data regarding effectiveness of warning devices and frequency of use by consumers so that more accurate cost-benefit analyses may be made. For these reasons, the provision of warning devices has been made optional by issuing an equipment standard.

Numerous manufacturers of fusees submitted comments which described the merits of fusees and concluded that the proposed rule would prohibit the use of fusees. Neither the rule as issued nor the proposed rule applies to devices which have a self-contained energy source, such as fusees, flare pots, and electric lanterns. Thus these devices may continue to be used as an alternative or a supplement to the device described in the standard.

Numerous comments from private citizens and State officials expressed concern that the required triangular shape of the warning device would prohibit the triangular Slow Moving Vehicle emblem currently used on many motor vehicles. Other comments supported the use of the triangular device because the triangular shapes would be used for similar purposes, to alert oncoming traffic that a reduction of speed is necessary due to a vehicle ahead. The Administration supports the dual use of the triangular symbol and it is intended that the warning device and the Slow Moving Vehicle emblem be complementary. As discussed in the notice of proposed rulemaking, State laws regarding slow moving vehicle emblems would be preempted by the standard only to the extent that they forbid the use of the triangular warning device intended by the standard.

Many comments recommended that the warning device be bi-directional in order to eliminate the possibility of placing the warning device with the non-reflective side facing oncoming traffic. It was pointed out that the increased cost of a bi-directional device over a unidirectional device would be minimal relative to the safety benefits provided. The NHTSA agrees, and accordingly the standard as issued requires the device to be bi-directional.

Some commenters felt that the motorist would subject himself to an additional safety hazard in placing the device approximately 100 feet behind the vehicle. Some suggested that the device be placed either on top of the vehicle or be capable of attaching to a window frame. While it is of course true that walking in a roadway can be hazardous, in the judgment of the NHTSA this risk is outweighed by the safety benefits of positioning the device at a distance behind the vehicle. Such positioning provides a greater distance over which oncoming traffic can recognize and respond to the warning and thus affords greater protection to the disabled vehicle.

Figures 3 through 9 indicating recommended positioning of warning devices have been consolidated into a single diagram indicating the suggested placement of the devices.

The permissible deviation from a vertical plane for the triangle when the device is placed on the road has been increased from five degrees to ten degrees in response to comments from manufacturers. The NHTSA has determined that the change will not alter the effectiveness of the device. The required distance above the ground of the lower edge of the triangle has been increased from one-half to one inch to improve the effectiveness of the device when water or mud collects on the roadway.

The minimum length of the legs of the triangle has been lowered from 18 to 17 inches, to correspond to the range of lengths permitted by the Bureau of Motor Carrier Safety.

The minimum width of the red reflective material has been clarified at the request of two manufacturers of reflex reflectors to correspond to industry terminology.

The definitions of the colors "red" and "orange" have been clarified in light of the comments, by the deletion of the definition in terms of nanometers. The NHTSA has concluded that definitions in terms of chromaticity coordinates and purity are sufficient. In order to standardize the requirement with respect to current color specification practice, the required chromaticity coordinates have been changed slightly.

The reflectivity requirement has been clarified to state that the material must be reflex reflective, and a definition of "reflex reflective" has been added to the standard. The reflectivity requirement in terms of candlepower per square inch has been found to be superfluous, and accordingly has been deleted.

The Economic Commission of Europe requested that the required total minimum candlepower per incident foot candle for an observation angle of 0.2 degrees be lowered from 120 candlepower to correspond to the international specifications. The NHTSA has concluded that 80 candlepower will provide sufficient protection and the minimum candlepower has been lowered accordingly.

In order to standardize the requirement with respect to current photometric practice, the luminance requirement for orange fluorescent material in the warning device has been raised from not less than 30 percent to not less than

35 percent of that of a flat magnesium oxide surface. The luminance criterion, "when compared under the light from an overcast sky," has been changed to read "when subjected to a 150-watt high pressure xenon compact arc lamp."

Many equipment manufacturers stated that the 200 degree Fahrenheit requirement for the high temperature conditioning is not justified by evidence showing that the device must withstand temperatures at that level when in use. This contention has been found to have merit, and the temperature requirement has been lowered to 150 degrees.

Effective date: January 1, 1974. Because the standard is issued later than anticipated, the effective date has been extended from January 1, 1972 to January 1, 1974. The NHTSA has concluded that this date will permit manufacturers of warning devices which do not have self-contained energy sources and which do not meet the specifications of the standard to retool for manufacture of complying devices. It is therefore found, for good cause shown, that an effective date more than one year from the date of issuance is in the public interest.

In consideration of the above, a new § 571.125, Standard No. 125, Warning Devices, is added to Title 49, Code of Federal Regulations. . . .

This rule is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on March 1, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 5038
March 9, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

(Docket 4–2; Notice 5)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 125, Warning Devices, in § 571.125 of Title 49, Code of Federal Regulations. The standard was issued on March 1, 1972 (37 F.R. 5038).

The Amerace-Esna Corporation suggested that the 98% purity requirement for the red reflex reflective material be deleted since the trichromatic color coefficients provide sufficient definition of the red color. The NHTSA agrees, and furthermore has determined that the purity requirement for the orange fluorescent material should be deleted for the same reasons. Accordingly, S5.3.1(c) and S5.3.2(c) are deleted from the rule.

Hawes Industries, Inc. requested that the standard permit the use of a triangular warning device designed to be secured on the roof of a motor vehicle. They stated that the roof location was more convenient to the consumer than the recommended positioning behind the car and afforded as much or more protection. As stated in the preamble to the standard, a number of comments advocating positioning of the device on the vehicle roof or side were received and reviewed by the NHTSA in the formulation of the final rule. The Administration determined that placement of the device behind the vehicle would provide maximum protection by affording a greater distance for recognition and response by oncoming traffic. For this reason, it has recommended positioning of the device 100 feet behind the vehicle and requires an illustration indicating this location to be provided in the instructions. The standard does not prohibit manufacture or sale of a device capable of being mounted on a vehicle roof, as long as it meets all the Standard 125 requirements, including the capability of being set up on the ground.

The standard requires that an illustration depicting recommended positioning of the device be included with the instructions for the device. The Administration is amending S5.1.5(c) to clarify its intent that the illustration provided be substantially identical to Figure 3.

The standard as issued establishes separate width requirements for red reflex reflective material and orange fluorescent material affixed to the faces of the warning device. Rowland Development Corporation stated that it manufactures a "dual purpose fluorescent orange-red reflective material," and requested that the separate width requirements be suspended when such material is used. The request appears to have merit, but NHTSA has concluded that an evaluation of the requirements pertaining to the fluorescent orange material is necessary before it can respond to this request. A notice of proposed rulemaking containing proposed changes will be issued when the evaluation is completed. When the final revised requirements for the fluorescent material are established, a precise definition of the dual purpose material can be formulated.

Prof. D. M. Finch of the University of California stated that in order to clarify the color requirements the respective sources of illumination for the measurement of the red and orange color should be specified. The NHTSA agrees that this should be done, and accordingly S5.3.1 has been modified to specify the use of a lamp with a tungsten filament operating at 2,854° K for the red measurement. The source of illumination for the measurement of the orange color will be specified with the revision of the fluorescent material requirements referred to above.

The word "tungsten" is inserted before the word "filament" in the rule, as a clarification of the test conditions for red color and reflectivity.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 125, Warning Devices, 49 CFR § 571.125, is amended. . . .

Effective date: January 1, 1974.

This notice is issued under the authority of sections 103, 112, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1401, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on June 19, 1972.

Douglas W. Toms
Administrator

37 F.R. 12323
June 22, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

Docket No. 4–2; Notice 6)

The purpose of this notice is to respond further to petitions for reconsideration and amendment of Motor Vehicle Safety Standard No. 125, Warning Devices, § 571.125 of Title 49, Code of Federal Regulations. The standard was issued on March 1, 1972, (37 F.R. 5038). On June 22, 1972, a previous notice of amendments and reconsideration of the standard was published (37 F.R. 12323).

With respect to the configuration of the device Rowland Development Corporation stated that it manufactures a dual purpose fluorescent orange and red reflective material and requested that the separate width requirements for red reflex reflective material and orange fluorescent material affixed to the faces of the device be suspended when such material is used. The NHTSA has concluded that the use of such dual purpose material as an alternative to separate material is permissible if the material is capable of meeting the requirements of Standard 125. S5.1.1, S5.2.3, S5.5, and S6.2(a) are hereby modified accordingly, and the separate width requirements will not be applicable when dual purpose material is used.

Tri-Lite interpreted the standard as permitting the use of a flag as part of a "combination signal device" as long as the device did not violate S5.2.1(b), relating to obstruction of the reflective and fluorescent material. In a previous letter to Tri-Lite the NHTSA had stated that the standard would be interpreted to allow such additions. (Docket entry N4–4–2–10, July 18, 1972.) Upon further consideration, the agency has determined that permitting additions to the device will lessen its effectiveness by degrading the uniformity of its shape. Accordingly, the use of additional shapes or attachments will not be permitted, and a new S5.2.6 is added to that effect.

A number of petitions regarding the orange fluorescent material were received. Personnel from the National Bureau of Standards suggested that the requirements for the color of the orange fluorescent material be amended so as not to penalize colors that have the same hue but are stronger than the present maximum y and minimum x values. The NHTSA agrees with the suggestion and S5.3.2 has been amended accordingly.

Tri-Lite stated that the fluorescent material deteriorates over time and is therefore unreliable. It requested that the provision of orange fluorescent material on the device be made optional. The NHTSA recognizes that deterioration of fluorescence is a possibility; however, it is felt that the requirement of an opaque container and the improving technology of fluorescent materials should offset the possible problem. It is anticipated that the device will be used only infrequently, in emergencies, by most drivers. The request of Tri-Lite is therefore denied.

Rowland Corp. requested that the luminance requirement be expressed in terms relative to the amount of fluorescent material affixed to the device rather than the percentage figure of magnesium oxide presently required. The agency position is that a minimum level of luminance is necessary for identifiability, but that a somewhat lower limit for luminance of the orange material could be suitable if more material is used. Accordingly, S5.5 has been amended to lower the minimum relative luminance relative to magnesium oxide from 35% to 25%, and to require a minimum product of that relative luminance and width in inches of the device of 44. Dayglo Color Corp. requested that two sources of light for luminance test, Source C and Source D–65, be permitted in addition to the xenon arc lamp specified in the standard. The NHTSA has concluded that the most consistent test results are provided when the material is diffusely irradiated with undispersed light from a high-pressure xenon arc lamp to simulate daytime conditions. As a general rule, alternative test procedures for a single property are inadvisable, and no sufficient justification for them has been shown here. Therefore the Dayglo request is denied.

In light of evidence that differing relative luminance values are obtained from different procedures used to measure it, a procedures paragraph (S6.3) for the luminance testing of the orange fluorescent material has been added to the standard. The procedure is adapted from the publication "Colorimetry", of the International Commission on Illumination (CIE Publication No. 15, E-1.3.1, 1971).

Two petitions dealt with the stability requirements. Rowland Development Corporation requested that the standard permit the manufacture of a triangle device constructed of flexible material which is secured at the outer corners of the triangle and is otherwise free to flex with the wind. Safety Triangles Company requested that the device be permitted to tilt to a position up to 30° from the vertical rather than the presently allowed 10°. These requests were directed at permitting manufacturers to produce lighter and cheaper devices. TheNHTSA has concluded that if the triangle is permitted to flex in the wind or tilt to a position up to 30° from the vertical, the attitude of the triangle is altered so that the shape of the equilateral triangle is distorted, thus detracting from one of the goals of the standard. The present performance requirements and the consequent cost factors have been found to be reasonable. These requests are accordingly denied.

With respect to reflectivity testing, Rowland stated that candlepower requirements for an observation angle of 0.2° were superfluous and not related to true highway situations, and requested their deletion. The NHTSA has determined in the formulation of the standard that the specified reflectivity requirements allow a maximum recognition and detection distance to oncoming traffic. Accordingy, the requirements for the 0.2° observation angle are retained

In consideration of the foregoing, Motor Vehicle Safety Standard No. 125, Warning Devices, 49 CFR § 571.125, is amended. . . .

Effective date: January 1, 1974.

(Sec. 103, 112, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 23, 1973.

Douglas W. Toms
Administrator

38 F.R. 2760
January 30, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

(Docket No. 74–2; Notice 10)

The purpose of this amendment to Motor Vehicle Safety Standard No. 125 (49 CFR 571.125), Warning Devices, is to prescribe the color specifications for the orange and red materials used in the warning devices authorized under the standard.

On April 6, 1973, the NHTSA issued a proposal on this subject (38 F.R. 8752). The comments from industry were generally in agreement with the method for testing the orange fluorescent material, although several requested that light source C be allowed for testing of the orange fluorescent material. After consultation with testing laboratories and the National Bureau of Standards, NHTSA has concluded that for purposes of obtaining repeatable results and simulating daylight conditions, source C does not provide the necessary ultraviolet radiation. Therefore, the use of the xenon arc lamp has been incorporated into the standard and will be required for testing of the orange color and luminescence of the daylight fluorescent material.

The majority of the commenters and the National Bureau of Standards agreed that the direct illumination method for testing of standard orange fluorescent material for both color and luminance should be continued, and the integrating sphere method should be used for dual-purpose materials. The industry, including the testing laboratories, have had sufficient time to utilize this method and repeatable results have been obtained.

The color definition equation for the orange fluorescent material has been broadened from $x+y=0.943$ to $x+y=0.93$. The majority of those commenting had no objection to broadening the area of the orange fluorescent material, but one equipment manufacturer desired the red boundary to be extended from $y=0.35$ to $y=0.34$. NHTSA concludes that to do so would place this boundary line too near the red area for proper differentiation between orange and red. Since orange is used as a daylight material, it should not be similar to the red material in color.

As proposed, the three-digit system in the straight-line equations for the boundary of the orange and red colors has been converted to a two-digit system, as this degree of accuracy is sufficient for general testing purposes.

The final amendment to the standard establishes the type of light to be used for testing the orange material used in dual purpose material. Of particular importance in this test procedure is separating the red retroreflective and orange fluorescent material. The majority of the commenters and the National Bureau of Standards recommended that the xenon arc lamp be used, as it provides sufficient ultraviolet radiation to simulate daylight conditions with overcast sky, if the unmodified spectrum illuminating the material is at an angle of incidence of 45° and the angle of observation is 90°. In this procedure, which is adopted, the material is illuminated diffusely by an integrating sphere.

Because a number of amendments to Standard No. 125 have been issued, the standard is hereby reissued in its entirety.

In light of the foregoing, 49 CFR § 571.125, Standard No. 125, Warning Devices, is amended to read as set forth below.

Effective date: Nov. 11, 1974.

(Sec. 103, 119, Pub. L. 89-563) 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on: Aug. 2, 1974.

James B. Gregory
Administrator
39 F.R. 28636
August 9, 1974

MOTOR VEHICLE SAFETY STANDARD NO. 125

Warning Devices

S1. Scope. This standard establishes requirements for devices, without self-contained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle.

S2. Purpose. The purpose of this standard is to reduce deaths and injuries due to rear end collisions between moving traffic and disabled vehicles.

S3. Application. This standard applies to devices without self-contained energy sources, that are designed to be carried in motor vehicles and used to warn approaching traffic of the presence of a stopped vehicle, except for devices designed to be permanently affixed to the vehicle.

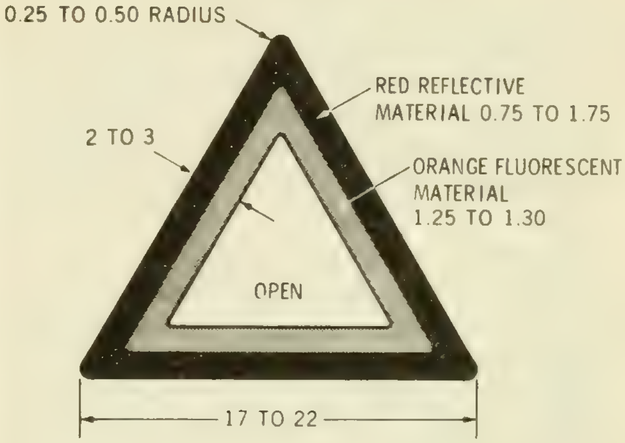
S.4. Definitions. "Entrance angle" means the angle having as its sides the line through the center, and normal to the face, of the object to be tested, and the line from the center of the object to the center of the source of illumination (Figure 2).

"Fluorescent" means the property of emitting visible light due to the absorption of radiation of a shorter wave-length which may be outside the visible spectrum.

"Observation angle" means the angle having as its sides the line from the observation point to the center of the object to be tested and the line from the center of that object to the center of the source of illumination (Figure 2).

"Reflex reflective" means reflective of light in directions close to the direction of incident light, over a wide range of variations in the direction of incident light.

WARNING DEVICE


0.25 TO 0.50 RADIUS
RED REFLECTIVE MATERIAL 0.75 TO 1.75
2 TO 3
ORANGE FLUORESCENT MATERIAL 1.25 TO 1.30
OPEN
17 TO 22

DIMENSIONS OF WARNING DEVICE (Inches)

Figure 1

S5. Requirements.

S5.1 Equipment.

S5.1.1 Reflex reflective material and fluorescent material that meet the requirements of this standard shall be affixed to both faces of the warning device. Alternatively, a dual purpose orange fluorescent and red reflective material that meets the requirements of this standard (hereafter referred to as "dual purpose material") may be affixed to both faces in place of the reflective and fluorescent materials.

S5.1.2 Each warning device shall be protected from damage and deterioration—

(a) By enclosure in an opaque protective reusable container, except that two or three warning devices intended to be sold for use as a set with a single vehicle may be enclosed in a single container; or

(b) By secure attachment to any light-tight, enclosed and easily accessible compartment of a new motor vehicle with which it is supplied by the vehicle manufacturer.

S5.1.3 The warning device shall be designed to be erected, and replaced in its container, without the use of tools.

S5.1.4 The warning device shall be permanently and legibly marked with:

(a) Name of manufacturer;

(b) Month and year of manufacture, which may be expressed numerically, as "6/72", and

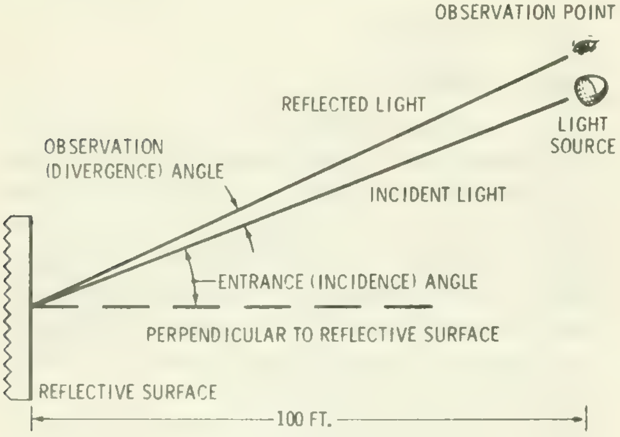
(c) The symbol DOT, or the statement that the warning device complies with all applicable Federal motor vehicle safety standards.

S5.1.5 Each warning device shall have instructions for its erection and display.

a) The instructions shall be either indelibly printed on the warning device or attached in such a manner that they cannot be easily removed.

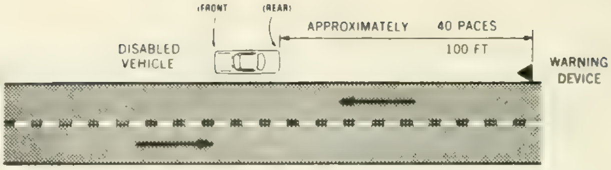
(b) Instructions for each warning device shall include a recommendation that the driver activate the vehicular hazard warning signal lamps before leaving the vehicle to erect the warning device.

(c) Instructions shall include the illustration depicted in Figure 3 indicating recommended positioning.


OBSERVATION POINT
REFLECTED LIGHT
LIGHT SOURCE
OBSERVATION (DIVERGENCE) ANGLE
INCIDENT LIGHT
ENTRANCE (INCIDENCE) ANGLE
PERPENDICULAR TO REFLECTIVE SURFACE
REFLECTIVE SURFACE
100 FT.

REFLECTIVITY TEST DIAGRAM

Figure 2



RECOMMENDED WARNING DEVICE POSITIONING

Figure 3

S5.2 Configuration

S5.2.1 When the warning device is erected on level ground:

(a) Part of the warning device shall form an equilateral triangle that stands in a plane not more than 10° from the vertical, with the lower edge of the base of the triangle horizontal and not less than 1 inch above the ground.

(b) None of the required portion of the reflective material and fluorescent material shall be obscured by any other part of the warning device except for any portion of the material over which it is necessary to provide fasteners, pivoting beads or other means to allow collapsibility or support of the device. In any event, sufficient reflective and fluorescent material shall be used on the triangle to meet the requirements of S5.4 and S5.5.

S5.2.2 Each of the three sides of the triangular portion of the warning device shall not be less than 17 and not more than 22 inches long, and not less than 2 and not more than 3 inches wide (Figure 1).

S5.2.3 Each face of the triangular portion of the warning device shall have an outer border of red reflex reflective material of uniform width and not less than 0.75 and not more than 1.75 inches wide, and an inner border of orange fluorescent material of uniform width and not less than 1.25 and not more than 1.30 inches wide (Figure 1). However, this requirement shall not apply if the dual purpose material is used.

S5.2.4 Each vertex of the triangular portion of the warning device shall have a radius of not less than 0.25 inch and not more than 0.50 inch.

S5.2.5 All edges shall be rounded or chamfered, as necessary to reduce the possibility of cutting or harm to the user.

S5.2.6 The device shall consist entirely of the triangular portion and attachments necessary for its support and enclosure, without additional visible shapes of attachments.

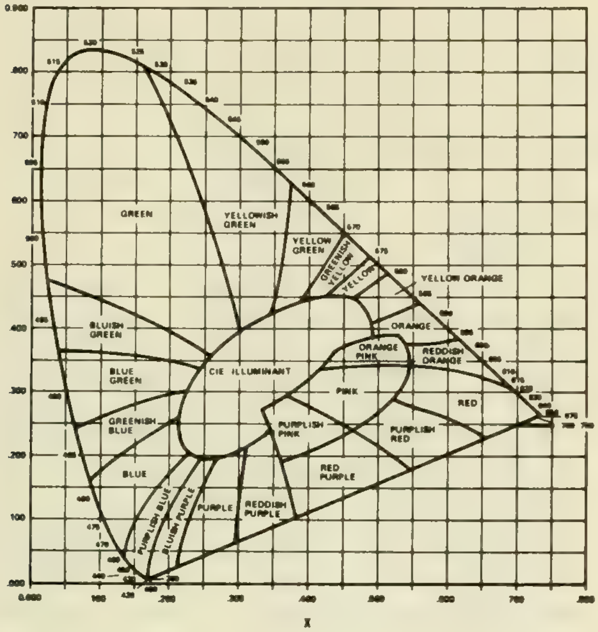


Figure 4. - CIE Chromaticity Diagram.

S5.3 Color.

S5.3.1 The color of the red reflex reflective material on the warning device shall have the following characteristics, both before and after the warning device has been conditioned in accordance with S6.1, when the source of illumination is a lamp with a tungsten filament operating at 2856° Kelvin color temperature. Expressed in terms of the International Commission on Illumination (CIE) 1931 standard colorimetric observer system (CIE chromaticity diagram, Figure 4), the chromaticity coordinates of the red reflex reflective material shall lie within the region bounded by the spectrum locus and the lines on the diagram defined by the following equations:

Boundary	*Equations*
Yellow	$y=0.33$
White	$x+y=0.98$

S5.3.2 The color of the orange fluorescent material on the warning device shall have the following characteristics, both before and after the warning device has been conditioned in accordance with S6.1, when the source of illumination is a 150-watt high pressure xenon compact arc lamp. Expressed in terms of the International Commission on Illumination (CIE) 1931 standard colorimetric observer system, the chromaticity coordinates of the orange fluorescent material shall lie within the region bounded by the spectrum locus and the lines on the diagram defined by the following equations:

Boundary	*Equation*
Yellow	$y=0.49x+0.17$
White	$x+y=0.93$
Red	$y=0.35$

The 150-watt high pressure xenon compact arc lamp shall illuminate the sample using the unmodified spectrum at an angle of incidence of 45° and an angle of observation of 90°. If dual purpose material is being tested, it shall be illuminated by a 150-watt high pressure xenon compact arc lamp, whose light is diffused by an integrating sphere.

S5.4 Reflectivity. When the red reflex reflective material on the warning device is tested in accordance with S6.2, both before and after the warning device has been conditioned in accordance with S6.1, its total candlepower per incident foot candle shall be not less than the values specified in Table I for each of the listed entrance angles.

S5.5 Luminance. When the orange fluorescent material on the warning device is tested in accordance with S6.3, both before and after the warning device has been conditioned in accordance with S6.1, it shall have a minimum relative luminance of 25 percent of a flat magnesium oxide surface and a minimum product of that relative luminance and width in inches of 44.

S5.6 Stability. When the warning device is erected on a horizontal brushed concrete surface both with and against the brush marks and subjected to a horizontal wind of 40 miles per hour in any direction for 3 minutes—

(a) No part of it shall slide more than 3 inches from its initial position;

(b) Its triangular potion shall not tilt to a position that is more than 10° from the vertical; and

(c) Its triangular position shall not turn through a horizontal angle of more than 10° in either direction from the initial position.

TABLE 1. Total Minimum Candlepower Per Incident Foot Candle

Observation Angles-Degrees	Entrance Angles - Degrees 0	10 up	10 down	20 left	20 right	30 left	30 right
0.2	80	80	80	40	40	8.0	8.0
1.5	0.8	0.8	0.8	0.4	0.4	0.08	0.08

S5.7 Durability. When the warning device is conditioned in accordance with S6.1, no part of the warning device shall become warped or separated from the rest of the warning device.

S6. Test Procedures.

S6.1 Conditions.

S6.1.1 Submit the warning device to the following conditioning sequence, returning the device after each step in the sequence to ambient air at 68° F. for at least 2 hours.

(a) Minus 40° F. for 16 hours in a circulating air chamber using ambient air which would have not less than 30 percent and not more than 70 percent relative humidity at 70° F.;

(b) 150° F. for 16 hours in a circulating air oven using ambient air which would have not less than 30 percent and not more than 70 percent relative humidity at 70° F.;

(c) 100° F. and 90 percent relative humidity for 16 hours;

(d) Salt spray (fog) test in accordance with American Society of Testing and Materials Standard B-117, Standard Method of Salt Spray (fog) testing, August 1964, except that the test shall be for 4 hours rather than 40 hours; and

(e) Immersion for 2 hours in water at a temperature of 100° F.

S6.2 Reflectivity Test. Test the red reflex reflective material as follows:

(a) Unless dual purpose material is used, prevent the orange fluorescent material from affecting the photometric measurement of the reflectivity of the red reflex reflective material, either by separation or masking.

(b) Use a lamp with a tungsten filament operating at 2856° Kelvin color temperature as the source of illumination.

(c) Place the source of illumination 100 feet from the red reflex reflective material (Figure 2).

(d) Place the observation point directly above the source of illumination (Figure 2).

(e) Calculate the total candlepower per incident foot candle of the red reflex reflective material at each of the entrance and observation angles specified in Table 1.

S6.3 Luminance Test. Test the orange fluorescent material as follows:

(a) Unless dual purpose material is used, prevent the red reflex reflective material from affecting the photometric measurement of the luminance of the orange fluorescent material.

(b) Using a 150-watt high pressure xenon compact arc lamp as the light source, illuminate the test sample at an angle of incidence of 45° and an angle of observation of 90°. If dual purpose material is being tested, illuminate the sample diffusely through an integrating sphere.

(c) Measure the luminance of the material at a perpendicular viewing angle, with no ray of the viewing beam more than 5° from the perpendicular to the specimen.

(d) Repeat the procedure for a flat magnesium oxide surface, and compute the quotient (percentage) of the luminance of the material relative to that of the magnesium oxide surface.

37 F.R. 5038
March 9, 1972

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 2)

This notice amends Part 571 of Title 49, Code of Federal Regulations, to add a new Motor Vehicle Safety Standard No. 126 (49 CFR 571.126) that requires manufacturers of slide-in campers and of trucks that would accommodate them to provide information concerning proper loading and load distribution. A notice of proposed rulemaking on this subject was published on April 9, 1971 (36 F.R. 6837).

The purpose of the new standard is to provide information that can be used to reduce overloading and improper load distribution in truck-camper combinations, and to prevent accidents resulting from the adverse effects of these conditions on vehicle handling and braking. Standard No. 126 requires manufacturers of slide-in campers to permanently affix a label to a rear surface of each camper that includes the weight of the camper when it contains standard equipment, and water, bottled gas, and ice box with ice or refrigerator. The camper manufacturer is also required to provide, in an owner's manual or other document delivered with the camper, a picture showing the location of the longitudinal center of gravity of the camper when loaded and a picture showing a proper match of the slide-in camper on a typical truck. Standard No. 126 also requires manufacturers of trucks to which a camper could be attached to provide, in an operator's manual or other document delivered with the truck, a picture showing the manufacturer's recommended longitudinal center of gravity zone for the cargo weight rating, and one depicting the proper match of a truck and slide-in camper.

Standard No. 126 differs from the proposal in several aspects. The standard as proposed would have applied to incomplete vehicles intended for completion as trucks, and to multipurpose passenger vehicles with a GVWR of 10,000 pounds or less. These categories have been excluded from the final rule, which applies to trucks that would accommodate slide-in campers. These generally are pick-up trucks. In excluding other proposed categories the NHTSA considers that the information the manufacturer of an incomplete vehicle must furnish pursuant to 49 CFR Part 568, *Vehicles Manufactured in Two or More Stages*, should be sufficient to assist a final assembler in permanently installing a chassis-mount camper on a truck chassis, or in assembling a vehicle such as a motor home.

The proposal would also have required that a label be permanently affixed to each cargo compartment that would specify the maximum recommended weight for a load placed in the compartment. Commenters argued persuasively that camper owners would disregard a series of weight capacity labels on all storage compartments, and the proposal was not adopted. The final rule requires the certification label and the owner's manual to provide a figure denoting camper weight, which as noted previously includes the weight of standard equipment, a refrigerator, or ice box with ice, and maximum capacity of water and bottled gas. The cubic capacity of the refrigerator or weight of ice, the weight of bottled gas, and the gallons of water encompassed in the maximum weight figure will also be listed on the permanent label and in the owner's manual. The camper manufacturer may exclude any of these items from the label if the camper is not designed to accommodate them, provided that a notation to that effect appears in the owner's manual. The standard also requires a manufacturer to provide a listing of optional or additional equipment that the camper is designed to carry, and the respective weight of each if the unit weight exceeds 20 pounds.

The label will also state the month and year of manufacture, and a recommendation that the user consult the owner's manual or data sheet for the weight of optional and additional equipment. The label is to be mounted in a plainly visible location on a surface at the rear of the camper other than the roof, steps or bumper extension.

The proposed reference point, or the distances of the camper center of gravity from the reference point, have not been adopted for use on the exterior label. Manufacturers of campers generally have had no experience with the relatively complex vertical center of gravity measurement techniques. Truck manufacturers pointed out a number of variables that would have to be considered, and stated that the limiting envelope would not be rectangular as implied by the proposal. Other comments objected to the end of the truck's axle shaft as a reference point for specifying a recommended cargo center of gravity zone. Variations in the longitudinal center of gravity of the load are, however, known to have a direct relationship to a truck's gross axle loading, and can adversely affect the steering and stopping ability of the vehicle. The camper manufacturer will therefore be required to provide in the owner's manual a picture showing the location of the camper's longitudinal center of gravity within 2 inches, under specified load conditions. A manufacturer can easily measure the longitudinal center of gravity of a slide-in camper by balancing it on a transverse horizontal rod. The camper owner's manual must also contain specific advice on proper choice of truck to which a camper may be mounted, and proper loading of the camper once it is attached. Truck manufacturers in turn are required to include in the operator's manual a picture showing the recommended longitudinal center of gravity zone for the cargo weight rating and loading recommendations.

In order to allow the relatively small camper manufacturers time to consider the recommendations of truck manufacturers, and to modify camper designs if needed, a camper manufacturer need not provide center of gravity location information until July 1, 1973.

Effective date: January 1, 1973, with additional requirements effective July 1, 1973. Because compliance with the rule does not involve extensive leadtime, the Administrator finds for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

In consideration of the foregoing, 49 CFR Part 571 is amended by adding § 571.126, Standard No. 126, *Truck-Camper Loading*. . . .

This notice is issued under the authority of Sections 103, 112, 114, and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1403, and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on August 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 16497
August 15, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 4)

This notice responds to petitions for reconsideration of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Truck-Camper Loading.* The portion of the regulation requiring information to be provided by camper manufacturers is retained as a Federal motor vehicle safety standard, and a vehicle information number is added to the list of information to be provided. The portion of the rule applicable to truck manufacturers is reissued as a consumer information regulation by a separate notice (37 F.R. 26607).

Standard No. 126, establishing requirements for slide-in campers and trucks that would accommodate them, was published on August 15, 1972 (37 F.R. 16497). Thereafter, pursuant to 49 CFR § 553.35, petitions for reconsideration of the standard were filed by Chrysler Corporation (Chrysler), Ford Motor Company (Ford), General Motors Corporation (GM), Jeep Corporation (Jeep), Motor Vehicle Manufacturers Association of the United States, Inc. (MVMA), Recreational Vehicle Institute, Inc. (RVI), and Toyota Motor Sales, U.S.A., Inc. (Toyota).

In response to information contained in several of these petitions the standard is being amended in certain respects. The Administrator has declined to grant requested relief from other requirements of the standard.

1. *Statutory Authority.* Standard No. 126 as issued applied to slide-in campers and to trucks that would accommodate them. It required manufacturers of slide-in campers to attach to their products a label containing the name of the manufacturer, the month and year of manufacture, a certification of conformity, and information concerning the camper's maximum weight. The standard also required camper manufacturers to provide the same information and certain additional items in a manual or other document to accompany each camper. A parallel requirement was adopted applicable to truck manufacturers; they were required to provide information in a manual or other document supplied with their products that would assist truck owners in choosing a properly matched camper.

Chrysler, Ford, GM, Jeep, and MVMA questioned the authority to issue the requirements of 49 CFR § 571.126 as a Federal motor vehicle safety standard rather than in the form of a Consumer Information Regulation (49 CFR Part 575), alleging that Standard No. 126 is "neither a performance standard nor does it provide any objective criteria for determining compliance."

The NHTSA does not agree that it lacks authority to issue Standard No. 126 in the form in which it appeared. Actually, the regulation was issued under the combined authority of four sections of the Act: section 103 (the authority for the Federal motor vehicle safety standards), section 112 (the primary authority for technical information and data to be provided by a manufacturer to NHTSA and the consumer), section 114 (the authority for vehicle and equipment certification) and section 119 (the general rulemaking authority). Many of the existing standards contain information requirements, and it is the position of this agency that such provisions fully satisfy the statutory criteria as objective performance requirements. The question therefore is in most respects the merely formal one of whether the rule is called a "safety standard" or a "consumer information regulation," and codified accordingly.

On reconsideration of all aspects of the standard, however, this agency has determined that there is an advantage to issuing the requirements for trucks in the form of a consumer information regulation. 49 CFR § 575.6(b) requires all Part 575 consumer information to be made available to prospective purchasers in dealer showrooms, and paragraph (c) of that section requires such information to be furnished directly to the NHTSA. Neither of these requirements applies to information furnished pursuant to Part 571 safety standards. Part 575 consumer information regulations are enforceable in substantially the same manner and with the same sanctions as safety standards. The requirements for trucks in 49 CFR § 571.126 are therefore reissued as a new consumer information regulation, 49 CFR § 575.103, by an action published in this issue, 37 F.R. 26607.

2. *Effective date.* The requirement for pictures showing camper center of gravity and proper truck-camper match that camper manufacturers were to provide as of July 1, 1973, is being deferred 2 months, and will not be required until September 1, 1973. RVI has petitioned for an extension of the effective date of these requirements to January 1, 1974, on the basis that the extension "would give the relatively small camper manufacturers additional time to conform camper design to the center of gravity envelopes developed by the truck manufacturers." The regulation, however, only requires manufacturers to provide information, not to redesign their products. The NHTSA finds that RVI has shown insufficient justification to support its request, and the petition is denied.

3. *Definitions.* RVI petitioned that its definition of "camper" be adopted so that there would be no confusion within the recreational vehicle industry as to whether the standard applied to motor homes and pickup covers. RVI's petition was similar to the one it submitted for reconsideration of Standard No. 205, *Glazing Materials.* The NHTSA has not adopted the RVI definition, but it has defined the terms "camper" and "slide-in camper" so as to clarify these terms and differentiate them from "motor home" and "pickup cover," also defined in Standard No. 205. "Cargo weight rating" was defined as "the maximum weight of cargo . . . that can safely be carried by a vehicle under normal operating conditions. . . ." Ford objects that the definition is subjective and urges that the term be redefined as "the maximum weight of cargo . . . that the truck manufacturer specifies may be carried on the vehicle." The NHTSA concurs generally with Ford's views. The definition has been rewritten to make clear that the rating, like GVWR and GAWR, is to be assigned at the discretion of the manufacturer.

4. *Information.* Ford believes the reference to "total load" in paragraph S5.1.2(c) is misleading "in that users may easily understand this to be the total load on the truck." It suggests substitution of the term "cargo load." Ford's point is well made, and the term is redesignated "total cargo load" as a clarification.

Toyota has asked that paragraph S5.1.2(e) be amended to substitute four inches for the requirement that camper manufacturers provide a picture showing the location of the center of gravity of the camper within an accuracy of two inches under the loaded condition. The petition is denied. The intent of the specification is to insure an accuracy within two inches, in either direction, in effect, a range of four inches. The NHTSA does not consider this tolerance to be overly demanding.

Finally, RVI states that its members have had difficulty in interpreting Figure 2 and requests the NHTSA to more clearly indicate "that the terminology 'Mount at Aft End of Truck Cargo Area' means that the designated point in the figure signifies the point where the identified surface of the camper abuts the rearmost edge or surface of the cargo area of the truck, presumably the tailgate in most configurations." To clarify its intent the NHTSA is changing the language in question to "point that contacts rear end of truck bed."

5. *Vehicle Identification Number (VIN.)* The NHTSA proposed on August 15, 1972 (Docket No. 71-7; Notice 3, F.R. 16505) that slide-in campers be identified by a VIN, consisting of arabic numerals, roman letters, or both. The notice also proposed to require that the VIN of two campers manufactured by a manufacturer within a ten year period shall not be identical. No objections were raised to the proposal, and Standard No. 126 is amended to adopt the pro-

posed requirements, reworded slightly effective January 1, 1973.

In consideration of the foregoing, 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, is amended. . . .

Effective date: January 1, 1973, with additional requirements effective September 1, 1973. Because the amendment consists principally of the reissue of existing requirements, and compliance with the amendment requiring a VIN does not involve extensive leadtime, the Administrator finds for good cause shown that an effective date eariler than 180 days after issuance is in the public interest.

This notice is issued under the authority of sections 103, 112, 114, and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1401, 1403, and 1407) and the delegation of authority from the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on: December 6, 1972.

Douglas W. Toms
Administrator

37 F.R. 26605
December 14, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 7)

This notice responds to a petition for reconsideration of 49 CFR § 571.126, Motor Vehicle Safety Standard No. 126, *Truck-camper loading*, with an amendment allowing optional wording of a portion of the placard to be affixed to campers, and of other required information. The amendments are effective upon publication in the *Federal Register.*

On August 15, 1972 Motor Vehicle Safety Standard No. 126 was originally published (37 F.R. 16497). In response to petitions for reconsideration the standard was republished on December 14, 1972 (37 F.R. 26605) with amendments that included minor changes in the text of information required to be furnished to purchasers of slide-in campers.

Paragraph S5.1.2(a) of Standard No. 126 requires each manufacturer of a slide-in camper to provide in a manual or other document delivered with each camper "the statement and information provided on the certification label as specified in paragraph S5.1.1". Among this information is the month and year that the camper was manufactured. The Trailer Coach Association has asked in a letter dated December 29, 1972 that wording such as "see certification label for date of manufacture" be substituted for the month and year of manufacture, contending that "to require manufacturers to list the month and year of manufacture in each vehicle owner's manual would be an unnecessary hardship in view of the production and shipping schedule which varies greatly from time to time during the year."

The NHTSA believes that the request of TCA is reasonable, and is treating TCA's letter as a petition for reconsideration filed pursuant to 49 CFR 553.35. However, since the information requirement became effective January 1, 1973, and because of the possibility that manufacturers now providing this data may wish to continue to do so, the manufacturer should have the option of including either the month and year of manufacture or a reference to the certification label. The standard is being amended to provide this option.

In the amendments published on December 14, 1972 two minor changes were made in terminology. In Paragraph S5.1.2(c) the phrase "total load", which appears twice, was changed to "total cargo load" as a clarification. Further clarification was provided in an amendment to Figure 2, Camper Center of Gravity Information where the legend "Mount at Aft End of Truck Cargo Area" was changed to "Point That Contacts Rear End of Truck Bed". In view of the amendments to § 575.103 delaying the effective date 30 days until April 1, 1973, and permitting use of the earlier form until October 1, 1973 (Docket No. 71–7; Notice 6 (38 F.R. 4400)), camper manufacturers who have printed manuals with the old terminology should be afforded the same opportunity as truck manufacturers to exhaust obsolete stocks of materials. Appropriate amendments are therefore made to Standard No. 126, including a 30 day delay in the pictorial information that was to have been provided as of September 1, 1973.

In consideration of the foregoing 49 CFR § 571.126 Motor Vehicle Safety Standard No. 126 is amended . . . .

Effective date: February 14, 1973. Because the amendments create no additional burden it is found for good cause that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Sec. 103, 112, 114, and 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1403 and 1407; delegation of authority at 49 CFR 1.51.)

Issued on February 12, 1973.

Douglas W. Toms
Administrator

38 F.R. 4399
February 14, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71-7; Notice 8)

This notice corrects the amendment to 49 CFR § 571.126, Standard No. 126, *Truck-camper loading*, published on February 14, 1973 (38 F.R. 4399). The amendment to paragraph S5.1.2(a) erroneously referred to "the information required by subparagraphs (c) and (d) of paragraph S5.1.1". The reference should have been to "subparagraphs (b) and (c)".

Additionally, the opening statement of the preamble erroneously stated that the amendment allowed "optional wording of a portion of the placard to be affixed to campers, and of other required information". The amendment itself correctly allowed optional wording of information provided in the manual or other document delivered with the camper, not on the placard.

Effective date: March 9, 1973. Because the amendment corrects an error, it is found for good cause shown that an immediate effective date is in the public interest.

(Sec. 103, 112, 114 and 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1401, 1403, and 1407; delegation of authority at 49 CFR 1.51.)

Issued on March 5, 1973.

Douglas W. Toms
Administrator

38 F.R. 6392
March 9, 1973

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71–7; Notice 10)

This notice amends Standard No. 126, *Truck-Camper Loading*, by removing the requirement that a camper's vehicle identification number (VIN) be printed in its owner's manual. Such a modification will reduce the cost of compliance with the standard, without adversely affecting the level of safety prescribed.

Effective Date: April 27, 1978.

For Further Information Contact:

Kevin Cavey, Crash Avoidance Division, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202–426–2716).

Supplementary Information: On November 29, 1973, the NHTSA issued a notice proposing to amend Standard No. 126, *Truck-Camper Loading*, to remove the requirement that the vehicle identification number (VIN) of each camper be printed in its owner's manual (38 FR 32945). The amendment, requested by the Recreation Vehicle Industry Association, was proposed to reduce the burdens and costs associated with compliance with the requirement.

Comments were received from Ford, the Recreation Vehicle Industry Association, and the Recreational Vehicle Division of the Trailer Coach Association. The Vehicle Equipment Safety Commission did not submit comments.

The three comments received supported the suggested modification. Some commenters asserted that the requirement added little to vehicle safety while resulting in increased costs and the increased possibility of errors associated with inserting the incorrect VIN in an owner's manual. The NHTSA concurs with the commenters and concludes that the intent of the requirement can be achieved by permitting a manufacturer to state in the owner's manual that the VIN can be found by referring to the camper's certification label. Accordingly, Standard No. 126 is amended to make optional the provision of the VIN in a camper's owner's manual. If the VIN is not placed in the owner's manual, a reference must be made in the manual to the location of the VIN on the certification label.

In consideration of the foregoing, the second sentence of paragraph S5.1.2 of Standard No. 126, 49 CFR Part 571.126 is amended. . . .

Since this amendment relieves a restriction and imposes additional burden on any person, it is found for good cause shown that an immediate effective date is in the public interest.

The principal authors of this notice are Kevin Cavey of the Office of Vehicle Safety Standards and Roger Tilton of the Office of Chief Counsel.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on April 21, 1978.

Joan Claybrook
Administrator

43 F.R. 17946
April 27, 1978

MOTOR VEHICLE SAFETY STANDARD NO. 126

Truck-Camper Loading

(Docket No. 71-7; Notice 2)

S1. Scope. This standard requires manufacturers of slide-in campers to affix a label to each camper that contains information relating to certification, identification, and proper loading, and to provide more detailed loading information in the owner's manual.

S2. Purpose. The purpose of this standard is to provide information that can be used to reduce overloading and improper load placement in truck-camper combinations, and unsafe truck-camper matching, in order to prevent accidents resulting from the adverse effects of these conditions on vehicle steering and braking.

S3. Application. This standard applies to slide-in campers.

S4. Definitions.

"Camper" means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

"Cargo weight rating" means the value specified by the manufacturer as the cargo-carrying capacity, in pounds, of a vehicle, exclusive of the weight of occupants in designated seating positions.

"Slide-in camper" means a camper having a roof, floor and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

S5. Requirements.

S5.1 Slide-in camper.

S5.1.1 Labels. Each slide-in camper shall have permanently affixed to it, in a manner that it cannot be removed without defacing or destroying it, in a plainly visible location on an exterior rear surface other than the roof, steps, or bumper extension, a label containing the following information in the English language lettered in block capitals and numerals not less than $\frac{3}{32}$-inch high, of a color contrasting with the background, in the order shown below and in the form illustrated in Figure 1.

MFG. BY: (CAMPER MANUFACTURER'S NAME)
(MONTH AND YEAR OF MANUFACTURE)
THIS CAMPER CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
CAMPER WEIGHT IS ______________ LBS. MAXIMUM
WHEN IT CONTAINS STANDARD EQUIPMENT, ______________
GAL. OF WATER, ______________ LBS. OF BOTTLED GAS,
AND ______________ CUBIC FT. REFRIGERATOR (or ICE
BOX WITH ______________ LBS. OF ICE, as applicable).
CONSULT OWNER'S MANUAL (or DATA SHEET as applicable) FOR WEIGHTS OF ADDITIONAL OR OPTIONAL EQUIPMENT.
(VEHICLE IDENTIFICATION NUMBER)

FIGURE 1. Label for Campers

(a) Name of camper manufacturer. The full corporate or individual name of the actual assembler of the camper shall be spelled out, except that such abbreviations as "Co.," or "Inc.," and their foreign equivalents, and the first and middle initials of individuals may be used. The name of the manufacturer shall be preceded by the words "Manufactured By" or "Mfd. By".

(b) Month and year of manufacture. It may be spelled out (*e.g.*, "June 1973"), or expressed in numerals (*e.g.*, "6/73).

(c) The statement: "This camper conforms to all applicable Federal Motor Vehicle Safety

Standards in effect on the date of manufacture shown above." The expression "U.S." or "U.S.A." may be inserted before the word "Federal."

(d) The following statement completed as appropriate: "CAMPER WEIGHT IS ________ LBS. MAXIMUM WHEN IT CONTAINS STANDARD EQUIPMENT, ________ GAL. OF WATER, ________ LBS. OF BOTTLED GAS, AND ________ CUBIC FT. REFRIGERATOR (or ICE BOX WITH ________ LBS. OF ICE, as applicable). CONSULT OWNER'S MANUAL (or DATA SHEET as applicable) FOR WEIGHTS OF ADDITIONAL OR OPTIONAL EQUIPMENT."

"Gal. of water" refers to the volume of water necessary to fill the camper's fresh water tanks to capacity. "Lbs. of bottled gas" refers to the weight of gas necessary to fill the camper's bottled gas tanks to capacity. The statement regarding a "Refrigerator" or "Icebox" refers to the capacity of the refrigerator with which the vehicle is equipped or the weight of the ice with which the icebox may be filled. Any of these items may be omitted from the statement, if the corresponding accessories are not included with the camper, provided that the omission is noted in the camper owner's manual as required in paragraph S5.1.2(a).

(e) Vehicle Identification Number. Each slide-in camper shall have a number assigned by its manufacturer for identification purposes consisting of arabic numerals, roman letters, or both. No two slide-in campers manufactured by the same manufacturer within any 10-year period shall have the same Vehicle Identification Number.

S5.1.2 Owner's manual. Each slide-in camper manufacturer shall provide with each camper a manual or other document containing the information specified in S5.1.2(a) through S5.1.2(d). The information in S5.1.2(e) and S5.1.2(f) shall also be provided with each camper manufactured on or after October 1, 1973.

(a) The statement and information provided on the certification label as specified in paragraph S5.1.1. Instead of the information required by subparagraphs (b), (c), and (e) of paragraph S5.1.1, a manufacturer may use the statements, "See camper certification label (located on camper's rear exterior surface) for month and year of manufacture and for the Vehicle Identification Number" and "This camper conforms to all applicable Federal Motor Vehicle Safety Standards in effect on the date of manufacture."

(b) A list of other additional or optional equipment that the camper is designed to carry, and the maximum weight of each if its weight is more than 20 lbs. when installed.

(c) The statement: "To estimate the total cargo load that will be placed on a truck, add the weight of all passengers in the camper, the weight of supplies, tools, and all other cargo, the weight of installed additional or optional camper equipment, and the manufacturer's camper weight figure. Select a truck that has a cargo weight rating that is equal to or greater than the total cargo load of the camper, and whose manufacturer recommends a cargo center of gravity zone that will contain the camper's center of gravity when it is installed." Until October 1, 1973, the phrase "total load" may be used instead of "total cargo load."

(d) The statements: "When loading this camper store heavy gear first, keeping it on or close to the camper floor. Place heavy things far enough forward to keep the loaded camper's center of gravity within the zone recommended by the truck manufacturer. Store only light objects on high shelves. Distribute weight to obtain even side-to-side balance of the loaded vehicle. Secure loose items to prevent weight shifts that could affect the balance of your vehicle. When the truck-camper is loaded, drive to a scale and weigh on the front and on the rear wheels separately to determine axle loads. The load on an axle should not exceed its gross axle weight rating (GAWR). The total of the axle loads should not exceed the gross vehicle weight rating (GVWR). These weight ratings are given on the vehicle certification label that is located on the left side of the vehicle, normally the dash panel, hinge pillar, door latch post, or door edge next to the driver on trucks manufactured on or after January 1, 1972. If weight ratings are exceeded, move or remove items to bring all weights below the ratings."

(e) A picture showing the location of the longitudinal center of gravity of the camper within an accuracy of 2 inches under the loaded condition specified in paragraph S5.1.1(d), in the manner illustrated in Figure 2. Until October 1, 1973 the phrase "Mount at Aft End of Truck Cargo Area" may be used in Figure 2 instead of "Point That Contacts Rear End of Truck Bed"

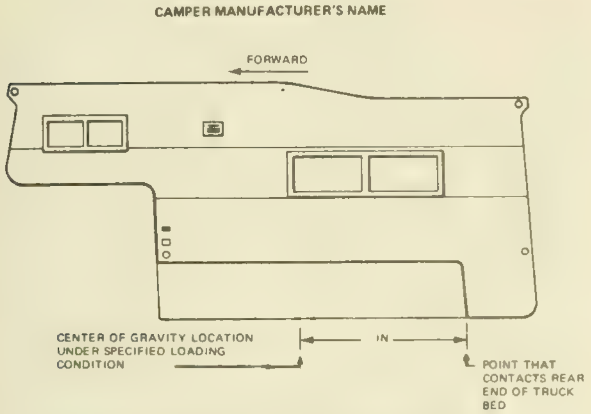

CAMPER MANUFACTURER'S NAME
FORWARD
CENTER OF GRAVITY LOCATION UNDER SPECIFIED LOADING CONDITION
IN
POINT THAT CONTACTS REAR END OF TRUCK BED

FIGURE 2 - CAMPER CENTER OF GRAVITY INFORMATION

(f) A picture showing the proper match of a truck and slide-in camper in the form illustrated in Figure 3.

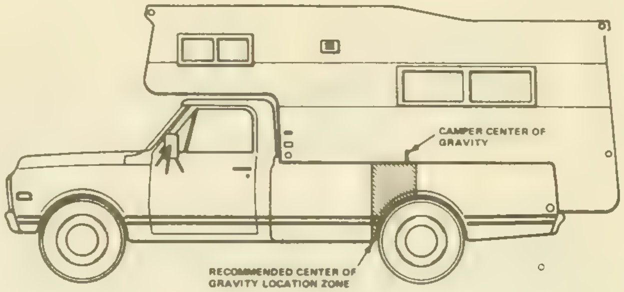


FIGURE 3 - EXAMPLE OF PROPER TRUCK AND CAMPER MATCH

37 F.R. 16497
August 15, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO.201

Occupant Protection In Interior Impact—Passenger Cars

(Docket No. 19)

Motor Vehicle Safety Standard No. 201, issued January 31, 1967, and published in the *Federal Register*, February 3, 1967 (32 F.R. 2413), specifies requirements for instrument panels, seat backs, protrusions, sun visors, and armrests to afford impact protection for occupants of passenger cars manufactured after January 1, 1968.

Parties adversely affected by the Standard were permitted to petition for reconsideration on or before March 6, 1967, pursuant to 23 CFR 215.17. By order dated March 29, 1967, the Acting Under Secretary of Commerce for Transportation consolidated the 27 petitions related to Standard No. 201 and ordered that a hearing on reconsiderations be held.

On April 21, 1967, the Federal Highway Administration issued an order directing that a rule-making hearing be held pursuant to 5 U.S.C. 553 (formerly sec. 4 of the Administrative Procedure Act (60 Stat. 238, 5 U.S.C. 1003). The hearing was held May 22 and 23, 1967, at Detroit, Mich., and May 24 and 25, 1967, at Washington, D.C. On June 22, 1967, the presiding officer submitted his Report of Recommended Findings to the Federal Highway Administration.

On June 8 and 9, 1967, and July 6 and 7, 1967, meetings were held by the National Highway Safety Bureau with domestic and foreign auto industry engineers in which detailed engineering discussions of all problems of compliance with the Standard were held.

After review of the evidence presented at the hearings ordered by the Federal Highway Administration, the report of the presiding officer, and the Bureau's analysis of the engineering meetings with the industry, I have determined that Standard 201 issued January 31, 1967, should be superseded by a new Standard that specifies initial requirements to afford impact protection for occupants, and that certain related definitions should be amended accordingly.

Good cause is shown that an effective date earlier than 180 days after issuance is in the public interest and notice and public procedure hereon are unnecessary since these amendments relieve restrictions and impose no additional burden on any person.

In consideration of the foregoing, Part 371, Initial Federal Motor Vehicle Safety Standards, is amended by superseding § 371.21, Motor Vehicle Safety Standard No. 201 (32 F.R. 2413), with a new Motor Vehicle Safety Standard No. 201 . . . and by amending § 371.3(b). . . .

These amendments are made under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority of March 31, 1967 (32 F.R. 5606), as amended April 6, 1967 (32 F.R. 6495), and becomes effective January 1, 1968.

Issued in Washington, D.C., on August 11, 1967.

Lowell K. Bridwell,
Federal Highway Administrator

32 F.R. 11776
August 16, 1967

PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 201

Occupant Protection in Interior Impact

(Docket No. 78-116; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

EFFECTIVE DATE: The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

ADDRESS: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

SUPPLEMENTARY INFORMATION: This notice amends Standard No. 201, *Occupant Protection in Interior Impact,* and Standard No. 203, *Impact Protection for the Driver From the Steering Control System,* to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement,* to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting,* and Standard No. 219-75, *Windshield Zone Intrusion,* led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars, Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arrguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed reulmaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivvated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201,203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manfacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done bySherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly edmonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA belives that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

Loading Requirements

At present, Standard No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

Commercial Vehicles

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting,* and Standard 219-75, *Windshield Zone Intrusion.* As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.

The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

Walk-In Vans

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention,* and 219-75, *Windshields Zone Intrusion.* The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their uniques driver/steering column configuration, and thus is exempting walk-in vans for the present.

Belts in Forward Control Vehicles

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection.* They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

Upgrading of Standard

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In additional, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy.absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children invilved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

Heavy Trucks

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited commens on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck reguylatory action may be needed.

Miscellaneous Comments

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment apprars to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a headform representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For protions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufactuere, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exceptions to Standard No. 201 and, if not, sought to have its instrument panel constured to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on teh instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

Costs and Leadtime

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been places in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said that the cost associated with complying with all three standards was $30. Ford estimated the cost for compliance with Standard No. 201 as $10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at $120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance, Bases on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of $16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a $27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between $6 and $15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design asssumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with

the standard, the DeLorean Corp. also examined the leadtime necessary to comply with the standards. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18–24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 20, 1979.

Joan Claybrook
Administrator

44 F.R. 68470
November 29, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 201

Federal Motor Vehicle Safety Standards; Standard No. 201, Occupant Protection in Interior Impact

[Docket No. 82-12; Notice 2]

ACTION: Final rule.

SUMMARY: Standard No. 201, *Occupant Protection in Interior Impact*, sets requirements for instrument panels, interior compartment doors, seat backs, sun visors, and arm rests to lessen injuries to persons thrown against them in crashes. At the request of Blue Bird Body Co., the agency proposed excluding school buses from the standard since they have to meet the requirements of Standard No. 222, *School Bus Passenger Seating and Occupant Protection.* The agency agrees that the seat back requirements of the two standards overlap and therefore has decided to exclude school buses from the seat back requirements of Standard No. 201. The other requirements of Standard No. 201 do not overlap with Standard No. 222 and therefore they will continue to apply to school buses.

DATE: The final rule is effective December 22, 1982.

SUPPLEMENTARY INFORMATION: On June 10, 1982 (47 F.R. 25169) the agency proposed an amendment to Standard No. 201, *Occupant Protection in Interior Impact*, that would exclude school buses from the seat back requirements of the standard. The agency issued the proposal in response to a request from Blue Bird Body Co., a school bus manufacturer. Blue Bird argued that since school buses have to comply with Standard No. 222, *School Bus Occupant Seating and Crash Protection*, whose requirements cover the same aspects of performance, they should not have to comply with Standard No. 201.

The only comment received by the agency supported adoption of the proposal. Because the agency has determined that compliance with the requirements of Standard No. 222 provides adequate protection, the agency has decided to adopt the proposal to exclude school buses from complying with the redundant seat back requirements of Standard No. 201.

Additional 201 Requirements

In addition to the requirements for seat backs, Standard No. 201 sets performance requirements for instrument panels, interior compartment doors, sun visors and arm rests to prevent or reduce injuries to persons thrown against them in crashes. Since Standard No. 222 does not contain any performance requirements for those specific items, it is not appropriate to exempt school buses complying with Standard No. 222 from those requirements of Standard No. 201.

Future Rulemaking

The one commenter to the docket, Mr. Edward deR. Cayia, proposed a change to the test procedures to Standard No. 201 and Standard No. 222. He pointed out that the two standards use different test devices in the head impact test of the standards. Standard No. 201 uses a 15-pound, 6.5 inch diameter headform. Standard No. 222 uses a headform that has two joined hemispheres with a total weight of 11.5 pounds; the one sphere has a diameter of 6.5 inches and the second, which is centered and protrudes from the first, has a 2-inch diameter. Mr. Cayia said that the Standard

No. 222 headform is a more accurate representation of the human facial structure.

The agency agrees that it would be desirable to have a uniform headform for the head impact tests of the two standards. The agency intends to evaluate the headforms to determine which would be the most appropriate and, based on that evaluation, will decide what rulemaking action is necessary.

Issued on November 15, 1982.

Raymond A. Peck, Jr.
Administrator
47 F.R. 52450
November 22, 1982

MOTOR VEHICLE SAFETY STANDARD NO. 201

Occupant Protection in Interior Impact—Passenger Cars

S1. Purpose and scope. This standard specifies requirements to afford impact protection for occupants.

S2. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less.

S3. Requirements for passenger cars and for trucks, buses and multipurpose passenger vehicles with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1981.

S3.1 Instrument panels. Except as provided in S3.1.1, when that area of the instrument panel that is within the head impact area is impacted in accordance with S3.1.2 by a 15 pound, 6.5 inch diameter head form at a relative velocity of 15 miles per hour, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

S3.1.1 The requirements of S3.1 do not apply to—

(a) Console assemblies;

(b) Areas less than 5 inches inboard from the juncture of the instrument panel attachment to the body side inner structure;

(c) Areas closer to the windshield juncture than those statically contactable by the head form with the windshield in place;

(d) Areas outboard of any point of tangency on the instrument panel of a 6.5 inch diameter head form tangent to and inboard of a vertical longitudinal plane tangent to the inboard edge of the steering wheel; or

(e) Areas below any point at which a vertical line is tangent to the rearmost surface of the panel.

S3.1.2 Demonstration procedures. Tests shall be performed as described in Society of Automotive Engineers Recommended Practice J921, "Instrument Panel Laboratory Impact Test Procedure," June 1965, using the specified instrumentation or instrumentation that meets the performance requirements specified in Society of Automotive Engineers Recommended Practice J977, "Instrumentation for Laboratory Impact Tests," November 1966, except that—

(a) The origin of the line tangent to the instrument panel surface shall be a point on a transverse horizontal line through a point 5 inches horizontally forward of the seating reference point of the front outboard passenger designated seating position, displaced vertically an amount equal to the rise which results from a 5 inch forward adjustment of the seat or 0.75 inches; and

(b) Direction of impact shall be either—

(1) In a vertical plane parallel to the vehicle longitudinal axis; or

(2) In a plane normal to the surface at the point of contact.

S3.2 Seat Backs. Except as provided in S3.2.1, when that area of the seat back that is within the head impact area is impacted in accordance with S3.2.2 by a 15 pound, 6.5 inch diameter head form at a relative velocity of 15 miles per hour, the deceleration of the head form shall not exceed 80g continuously for more than 3 milliseconds.

S3.2.1 [The requirements of S3.2 do not apply to seats installed in school buses which comply with the requirements of Standard No. 222, "School Bus Passenger Seating and Occupant Protection" (49 CFR 571.222) or to rearmost, side-facing, back-to-back, folding auxiliary jump, and temporary seats. (47 F.R. 52450 November 22, 1982. Effective: December 22, 1982)]

S3.2.2 Demonstration procedures. Tests shall be performed as described in Society of Automotive Engineers Recommended Practice J921, "Instrument Panel Laboratory Impact Test Procedure," June 1965, using the specified instrumentation or instrumentation that meets the performance requirements specified in Society of

Automotive Engineers Recommended Practice J977, "Instrumentation for Laboratory Impact Tests," November 1966, except that—

(a) The origin of the line tangent to the uppermost seat back frame component shall be a point on a transverse horizontal line through the seating reference point of the right rear designated seating position, with adjustable forward seats in their rearmost design driving position and reclinable forward seat backs in their nominal design driving position;

(b) The direction of impact shall be either—

(1) In a vertical plane parallel to the vehicle longitudinal axis; or

(2) In a plane normal to the surface at the point of contact;

(c) For seats without head restraints installed, tests shall be performed for each individual split or bucket seats back at points within 4.0 inches left and right of its centerline, and for each bench seat back between points 4.0 inches outboard of the centerline of each outboard designated seating position;

(d) For seats having head restraints installed, each test shall be conducted with the head restraint in place at its lowest adjusted position, at a point on the head restraint centerline; and

(e) For a seat that is installed in more than one body style, tests conducted at the fore and aft extremes identified by application of subparagraph (a) shall be deemed to have demonstrated all intermediate conditions.

S3.3 Interior compartment doors. Each interior compartment door assembly located in an instrument panel, console assembly, seat back, or side panel adjacent to a designated seating position shall remain closed when tested in accordance with either S3.31(a) and S3.3.1(b) or S3.3.1(a) and S3.3.1(c). Additionally, any interior compartment door located in an instrument panel or seat back shall remain closed when the instrument panel or seat back is tested in accordance with S3.1 and S3.2. All interior compartment door assemblies with a locking device must be tested with the locking device in an unlocked position.

S3.3.1 Demonstration procedures.

(a) Subject the interior compartment door latch system to an inertia load of 10g in a horizontal transverse direction and an inertia load of 10g in a vertical direction in accordance with the procedure described in section 5 of SAE Recommended Pactice J839b, "Passenger Car Side Door Latch Systems," May 1965, or an approved equivalent.

(b) Impact the vehicle perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

(c) Subject the interior compartment door latch system to a horizontal inertia load of 30g in a longitudinal direction in accordance with the procedure described in section 5 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965 or an approved equivalent.

S3.4 Sun visors.

S3.4.1 A sun visor that is constructed of or covered with energy-absorbing material shall be provided for each front outboard designated seating position.

S3.4.2 Each sun visor mounting shall present no rigid material edge radius of less than 0.125 inch that is statically contactable by a spherical 6.5 inch diameter head form.

S3.5 Armrests.

S3.5.1 General. Each installed armrest shall conform to at least one of the following:

(a) It shall be constructed with energyabsorbing material and shall deflect or collapse laterally at least 2 inches without permitting contact with any underlying rigid material.

(b) It shall be constructed with energy-absorbing material that deflects or collapses to within 1.25 inches of a rigid test panel surface without permitting contact with any rigid material. Any rigid material between 0.5 and 1.25 inches from the panel surface shall have a minimum vertical height of not less than 1 inch.

(c) Along not less than 2 continuous inches of its length, the armrest shall, when measured vertically in side elevation, provide at least 2 inches of coverage within the pelvic impact area.

S3.5.2 Folding armrests. Each armrest that folds into the seat back or between two seat backs shall either—

(a) Meet the requirement of S3.5.1; or

(b) Be constructed of or covered with energy-absorbing material.

33 F.R. 15794
October 25, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

(Docket No. 8)

A proposal to amend § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, by adding a new standard, Head Restraints—Passenger Cars; was published in the *Federal Register* on December 28, 1967 (32 F.R. 20865).

Interested persons have been afforded an opportunity to participate in the making of the amendment.

Several comments requested that the use of a 50th percentile adult male manikin be permitted in demonstrating compliance with the Standard. The Administration feels that a 50th percentile manikin is not representative of a large enough percentage of the public, but recognizes that certain modifications to a 50th percentile manikin may result in a suitable test device. Therefore, the Standard has been modified to permit use of an approved equivalent test device.

A comment from an equipment manufacturer and an equipment manufacturers' association asserted that the Standard should not require that motor vehicle manufacturers provide head restraints at the time of vehicle manufacture, but that each customer should be free to equip his vehicle with head restraints of his own choice, maintaining that the installation of head restraints is a relatively simple matter and that there appears to be virtually no technological advantage in requiring factory installation. The Administration has determined that safety dictates that head restraints be provided on all passenger cars manufactured on or after January 1, 1969, and that a head restraint standard that merely specified performance requirements for head restraint equipment would not insure that all passenger cars would be so equipped, and would not, therefore, meet the need for safety. Furthermore, the Administration has determined that the performance of a head restraint is dependent upon the strength of the structure of the seat to which it is attached, as well as the compatibility of the head restraint with its anchorage to the seat structure.

Some of the comments expressed concern that the proposed Standard would exclude the use of head restraints that are integral with the seat back. The Administration did not intend to imply that "add-on" head restraint devices are the only available means of providing appropriate levels of protection. Such protection may be achieved by the use of a restraint system that is integral with the seat back.

Some comments noted that when testing head restraints that are adjustable to a height of more than 27.5 inches above the seating reference point, the load would not be applied to the appropriate portion of the head restraint. To provide the necessary flexibility, the Standard has been modified to specify that the point of load application and the point of width measurement be determined relative to the top of the head restraint rather than the seating reference point.

Some comments stated that the 8g performance requirement would be incomplete without the inclusion of a time duration requirement. The Administration has concluded that a minimum time duration of 80 milliseconds is appropriate and the Standard has been so modified.

Some comments requested that the location of the head restraint relative to the torso line be measured without a load being applied to the head restraint. The Administration feels that this measurement would be unrealistic and, therefore, the Standard requires that the measurement be taken during the application of the 132-pound initial load.

Many comments requested a more precise description of the method to be used in locating the test device's reference line and torso reference line. Therefore, the Standard has been modified to provide the necessary clarification.

Some comments claimed that lead time would be a problem; however, the Administration believes that the need to protect the public from neck injury outweighs the possible lead time problems.

Several comments requested clarification of the term "approved representation of a human articulated neck structure." "Approved" is defined in § 371.3(b) as "approved by the Secretary." The Secretary would approve the neck structure of a test device if it could be demonstrated by technical test data that the articulation of the neck structure represented that of a human neck. Approval could only be given to a structure sufficiently described in performance parameters to ensure reliable and reproducible test data.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standards, is amended by adding Standard No. 202 ... Effective January 1, 1969.

(Secs. 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966; 15 U.S.C. 1392, 1407; and the delegation of authority of Mar. 31, 1967, 32 F.R. 5606; as amended Apr. 6, 1967, 32 F.R. 6495; July 27, 1967, 32 F.R. 11276; Oct. 11, 1967, 32 F.R. 14277; Nov. 8, 1967, 32 F.R. 15710, and Feb. 8, 1968)

Issued in Washington, D.C., on February 12, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 2945
February 14, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

(Docket No. 8)

Motor Vehicle Safety Standard No. 202, issued February 12, 1968, and published in the *Federal Register* February 14, 1968 (33 F.R. 2945), specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions to occupants of passenger cars manufactured after January 1, 1969.

Pursuant to 23 CFR 216.35 (32 F.R. 15818), interested persons could petition the Federal Highway Administrator for reconsideration on or before March 15, 1968.

Several petitioners questioned the 80 millisecond duration requirement of the 8g dynamic test on the grounds that it imposes a more severe load on the seat back than is required in Motor Vehicle Safety Standard No. 207, Anchorage of Seats—Passenger Cars. The Administrator has determined that the demonstration procedure should be revised to incorporate a half-sine wave acceleration pulse shape with an amplitude of 8g and a base (duration) of 80 milliseconds. This revised loading is closer to actual crash conditions, and is more consistent with existing seat strength requirements. The demonstration procedure has been revised to include the half-sine wave pulse shape.

Several petitioners questioned the method for establishing the displaced torso line for the static test on the grounds that it did not take into account the compression of the seat back cushion by the torso under load. The Administrator has determined that the Standard should be revised to take into account seat back cushion compression in establishing the displaced torso line, and the demonstration procedure has been revised accordingly.

One petitioner questioned the procedure outlined for establishing the dummy reference line for the dynamic test. The procedure made use of the torso line of the 95th percentile dummy or test device and there is no commonly accepted definition of this torso line. The Administrator has revised the procedure for establishing dummy torso reference lines to make use of the SAE two-dimensional manikin, with its torso line established in accordance with SAE Aerospace--Automotive Drawing Standards.

One petitioner questioned the requirement that a spherical head form be used to apply the static load because tests have shown that this head form tends to slip under the foundation structure of the head restraint, thus showing an unrealistic loss of load. The Administrator has revised the demonstration procedure to include a cylindrical head form as an alternative.

One petitioner requested that the static load requirement of 200 pounds for head restraints adjusted to a height of 27.5 inches be changed to an equivalent moment about the seating reference point. This would permit the manufacturer who has a head restraint which adjusts higher than 27.5 inches to subject his head restraint to less than a 200 pound static load. This petition is denied. The Administrator has determined that the 200 pound static load should remain in the Standard to ensure that all head restraints sustain this load to meet the needs of safety.

Since this amendment provides clarification, relieves a restriction, and imposes no additional burden, notice and public procedure are unnecessary.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 202, which becomes effective January 1, 1969, is amended by revising sections 5.1 and 5.2 (relating to the demonstration procedures). . . .

(Secs. 103, 119, National Traffic and Motor Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority of March 31, 1967 (32 F.R. 5606), as amended April 11, 1968 (33 F.R. 5803))

Issued in Washington, D.C., on April 11, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 5793
April 16, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

(Docket No. 8)

Motor Vehicle Safety Standard No. 202 (33 F.R. 2945), as amended (33 F.R. 5793), specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions to occupants of passenger cars manufactured after January 1, 1969.

Paragraph S4(b)(2) of the Standard provides that a head restraint qualifying under the static procedure shall have a lateral width of 10 inches for use with bench-type seats and 6.75 inches for use with individual type seats when measured 2.5 inches below the top of the head restraint.

One manufacturer has petitioned the Administrator for reconsideration of the method by which the lateral width of the head restraint is to be measured. The petitioner requests that the Standard be revised to permit the width to be measured either 2.5 inches below the top of the head restraint of 25 inches above the seating reference point.

Measurement of width 2.5 inches below the top of the head restraint may present possible difficulties for manufacturers of vehicles with head restraints which are integrated into the seat back. These manufacturers may elect to exceed the minimum required height of 27.5 inches to accommodate tall occupants and taper the top portion of the head restraint to provide minimum visibility restriction. In this case, the head restraint, when measured 2.5 inches below the top, might meet the minimum width requirement.

The Administrator has determined that the procedure for measuring head restraint lateral width should be revised since it is in the public interest to encourage the additional protection offered by seat backs higher than the minimum height requirement of this Standard. Accordingly, the Standard is being amended to permit measurement of head restraint width either 2.5 inches below the top of the head restraint or 25 inches above the seating reference point.

Paragraph S5.1(c) of the Standard provides that the magnitude of the acceleration curve for the dynamic test shall not be less than that of a half-sine wave having the amplitude of 8g and a duration of 80 milliseconds not more than 20% above the half-sine wave.

One manufacturer has requested an interpretation of the term "not more than 20% above the half-sine wave."

It is necessary that a test tolerance be allowed because of equipment variances. However, the tolerance must be properly limited to prevent very severe accelerations which might fail the seat back without properly testing the head restraint. The intent of the "20%" limitation was to establish a half-sine wave upper limit curve having an amplitude of 9.6g and a duration of 96 milliseconds.

Accordingly, the Standard is being amended to require that the magnitude of the acceleration curve be not more than that of a half-sine wave curve having an amplitude of 9.6g and a duration of 96 milliseconds. In addition, the equation for the lower limit curve is being deleted since it imposes an unnecessary restriction on the lateral location of the curve. By removing the equation, the limit curves can then be moved laterally with respect to each other to allow for normal test variances.

Since these amendments provide clarification and an alternate means of compliance, relieve restrictions, and impose no additional burden, I find that for good cause shown notice and public procedure are unnecessary, and that an effective date for these amendments of less than 180 days is in the public interest.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 202, as amended, is further amended effective January 1, 1969. . . .

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority contained in Section 1.4(c) of Part 1 of the Regulations of the Office of the Secretary of Transportation (49 CFR 1.4(c)).

Issued in Washington, D.C., on October 3, 1968.

Lowell K. Bridwell,
Federal Highway Administrator

33 F.R. 15065
October 9, 1968

MOTOR VEHICLE SAFETY STANDARD NO. 202

Head Restraints—Passenger Cars

S1. Purpose and Scope. This standard specifies requirements for head restraints to reduce the frequency and severity of neck injury in rear-end and other collisions.

S2. Application. This standard applies to passenger cars.

S3. Definitions. "Head restraint" means a device that limits rearward angular displacement of the occupant's head relative to his torso line.

S4. Requirements. A head restraint that conforms to either (a) or (b) shall be provided at each outboard front designated seating position—

(a) It shall, when tested in accordance with S5.1, during a forward acceleration of at least 8g on the seat supporting structure, limit rearward angular displacement of the head reference line to 45° from the torso reference line; or

(b) It shall, when adjusted to its fully extended design position, conform to each of the following—

(1) When measured parallel to torso line, the top of the head restraint shall not be less than 27.5 inches above the seating reference point;

(2) When measured either 2.5 inches below the top of the head restraint, or 25 inches above the seating reference point, the lateral width of the head restraint shall be not less than—

(i) 10 inches for use with bench-type seats; and

(ii) 6.75 inches for use with individual seats;

(3) When tested in accordance with S5.2, the rearmost portion of the head form shall not be displaced to more than 4 inches perpendicularly rearward of the displaced entended torso reference line during the application of the load specified in S5.2(c); and

(4) When tested in accordance with S5.2, the head restraint shall withstand an increasing load until one of the following occurs—

(i) Failure of the seat or seat back; or

(ii) Application of a load of 200 pounds.

S5. Demonstration Procedures.

S5.1 Compliance with S.4(a) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position:

(a) On the exterior profile of the head and torso of a dummy having the weight and seated height of a 95th percentile adult male with an approved representation of a human, articulated neck structure, or an approved equivalent test device, establish reference lines by the following method:

(1) Position the dummy's back on a horizontal flat surface with the lumbar joint in a straight line.

(2) Rotate the head of the dummy rearward until the back of the head contacts the same horizontal surface in (1).

(3) Position the SAE J-826 two-dimensional manikin's back against the flat surface in (1), alongside the dummy with the h-point of the manikin aligned with the h-point of the dummy.

(4) Establish the torso line of the manikin as defined in SAE Aerospace-Automotive Drawing Standards, Sec. 2.3.6, P. E1.01, September 1963.

(5) Establish the dummy torso reference line by superimposing the torso line of the manikin on the torso of the dummy.

(6) Establish the head reference line by extending the dummy torso reference line onto the head.

(b) At each designated seating position having a head restraint, place the dummy, snugly restrained by a Type 1 seat belt, in the manufacturer's recommended design seated position.

(c) During a forward accleration applied to the structure supporting the seat as described below, measure the maximum rearward angular displacement between the dummy torso reference line and the head reference line. When graphically depicted, the magnitude of the acceleration curve shall not be less than that of a half-sine wave having the amplitude of 8g and a duration of 80 milliseconds and not more than that of a half-sine wave curve having an amplitude of 9.6g and a duration of 96 milliseconds.

S5.2 Compliance with § 4.(b) shall be demonstrated in accordance with the following with the head restraint in its fully extended design position:

(a) Place a test device, having the back pan dimensions and torso line, (centerline of the head room probe in full back position) of the three dimensional SAE J-826 manikin, at the manufacturer's recommended design seated position.

(b) Establish the displaced torso reference line by applying a rearward moment of 3300 in. lb. about the seating reference point to the seat back through the test device back pan located in (a).

(c) After removing the back pan, using a 6.5 inch diameter spherical head form or a cylindrical head form having a 6.5 inch diameter in plain view and a 6-inch height in profile view, apply, perpendicular to the displaced torso reference line, a rearward initial load 2.5 inches below the top of the head restraint that will produce a 3300 in. lb. moment about the seating reference point.

(d) Gradually increase this initial load to 200 lbs. or until the seat or seat back fails, whichever occurs first.

33 F.R. 15065
October 9, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 203

Impact Protection from the Steering Control System

(Docket No. 74–33; Notice 2)

This notice amends Standard No. 203, *Impact protection from the steering control system*, 49 CFR § 571.203, to exclude from its requirements some passenger cars which meet the frontal barrier crash requirements of Standard No. 208, *Occupant crash protection*, 49 CFR § 571.208.

The NHTSA proposed this exclusion of vehicles from the requirements of Standard No. 203 at the request of General Motors, to permit development of an air cushion restraint system at the driver's position as a means of meeting the frontal barrier crash protection requirements (S5.1) of Standard No. 208 (39 F.R. 34062, September 23, 1974). General Motors sought the exclusion because its modification to the steering control system to incorporate the air cushion system and accept higher loads exerted during a crash makes conformity of the column with Standard No. 203 difficult and sometimes impossible.

Comments were received from General Motors Corporation and Volvo of America Corporation, in support of the proposal. Renault, Inc., Peugeot, Inc., and Mercedes-Benz of North America, Inc., supported the proposal and suggested that the exception be extended to passive straint systems that incorporate seat belts. These comments argue that the use of passive belts will be high and that the protection offered by Standard No. 203 would in nearly all cases be redundant to that of Standard No. 208.

As a general matter, the NHTSA has maintained that the redundant occupant crash protection offered by standards (e.g., Standard No. 212, *Windshield retention*) is justified for those situations where the primary occupant crash protection system fails, or multiple collisions occur. Redundant protection is particularly justified in the case of passive seat belts because of the greater likelihood that seat belt protection will be rendered inoperative by an occupant than will crash-deployed protection.

In this case, the NHTSA has made the limited determination that the redundant protection offered by Standard No. 203 is not justified where it directly interferes with development of a more advanced, convenient, and effective restraint system. In contrast, it is obvious that passive systems which utilize belt assemblies do not require modifications of steering control systems and there is, therefore, no reason to sacrifice the redundant protection. These petitions to expand the scope of the proposed exception are accordingly denied.

American Motors Corporation has suggested that an exception not be granted in this case until future requirements of Standard No. 208 are established, and that General Motors' developmental work be undertaken on the basis of a temporary exemption under 49 CFR Part 555. This approach has not been adopted by the NHTSA. In light of the financial commitments that might be involved, this agency has concluded that General Motors is entitled to the assurance that their developments on advanced Standard No. 208 systems will not be barred by Standard No. 203 in the future.

In consideration of the foregoing, paragraph S3 (application) in Standard No. 203 (49 CFR § 571.203) is amended. . . .

Effective date: [30 days following date of publication of the amendment in the *Federal Register*]. Because this amendment relieves a restriction, it is found for good cause shown that an effective date sooner than 180 days from the date of its publication in the *Federal Register* is in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on April 17, 1975.

James B. Gregory
Administrator

40 F.R. 17992
April 24, 1975

PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 203

Impact Protection for the Driver From the Steering Control System

(Docket No. 78-116; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

EFFECTIVE DATE: The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

ADDRESS: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

SUPPLEMENTARY INFORMATION: This notice amends Standard No. 201, *Occupant Protection in Interior Impact,* and Standard No. 203, *Impact Protection for the Driver From the Steering Control System,* to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement,* to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting,* and Standard No. 219-75, *Windshield Zone Intrusion,* led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars, Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arrguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed reulmaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivvated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201,203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manfacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done bySherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly edmonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA belives that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

Loading Requirements

At present, Standared No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

Commerical Vehicles

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting,* and Standard 219-75, *Windshield Zone Intrusion.* As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.

The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

Walk-In Vans

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212-76, *Windshield Retention,* and 219-75, *Windshields Zone Intrusion.* The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their uniques driver/steering column configuration, and thus is exempting walk-in vans for the present.

Belts in Forward Control Vehicles

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection.* They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

Upgrading of Standard

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

Heavy Trucks

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

Miscellaneous Comments

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a headform representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exeptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

Costs and Leadtime

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been places in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said that the cost associated with complying with all three standards was $30. Ford estimated the cost for compliance with Standard No. 201 as $10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at $120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance, Bases on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of $16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a $27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between $6 and $15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design asssumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with

the standard. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18–24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 12, 1979.

Joan Claybrook
Administrator

44 F.R. 68470
November 29, 1979

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 203

Federal Motor Vehicle Safety Standards; Impact Protection for the Driver from the Steering Control Systems

[Docket No. 81-10; Notice 2]

ACTION: Final rule.

SUMMARY: This notice amends Standard No. 203, *Impact Protection for the Driver from the Steering Control System*, to modify the current limitation on the amount of force imposed on the steering column during the compliance test which simulates a crash. The standard will now allow the force measured on the steering column to exceed 2,500 pounds for a cumulative duration of not more than 3 milliseconds. The agency has concluded that this amendment will not pose an unreasonable risk to safety.

EFFECTIVE DATE: This amendment is effective December 2, 1982.

SUPPLEMENTARY INFORMATION: In response to a petition for rulemaking from General Motors (GM), NHTSA issued a notice in October 1981 (49 F.R. 48260) that proposed an amendment to Standard No. 203, *Impact Protection for the Driver from the Steering Control System* (46 CFR 571.203). The notice proposed modifying the current 2,500 pound limitation on the amount of force imposed on the steering column. The force is measured during an impact test in which a hard rubber block simulating the human torso strikes the steering column at 15 miles per hour.

GM sought the change because a mechanical interference between several parts in its tilting and telescoping steering wheel cause the force measured in the Standard No. 203 impact test to momentarily increase above 2,500 pounds. The mechanical interference only occurs when the steering wheel is fully telescoped and tilted down 15 degrees. GM requested and the agency proposed to prohibit forces above 2,500 pounds only if they cumulatively exceeded 3 milliseconds in duration.

To support its request, GM presented data from three sled tests simulating 30 mile-per-hour frontal barrier crashes in which an unrestrained Part 572 anthropomorphic test dummy struck the steering column. The GM tests showed that the momentary increase in force levels measured on the steering column do not cause a corresponding increase in the resultant acceleration in the test dummy's chest. (Resultant acceleration is the criterion used in Standard No. 208, *Occupant Crash Protection*, as a means of determining whether forces are potentially harmful.)

This notice amends Standard No. 203 to adopt the proposed change. Significant comments submitted to the docket are addressed below.

Five commenters, American Motors, Chrysler, Ford, General Motors, and Volkswagen, supported adoption of the proposed amendment. The Insurance Institute for Highway Safety (IIHS) and the Center for Auto Safety (CFAS) filed comments opposing the amendment.

IIHS argued that the GM test data considered by the agency do not demonstrate that the short duration force levels permitted by the amendment will not pose an unreasonable risk of injury to the driver. IIHS objected that GM had not discussed the relationship between the 30 mile-per-hour impact tests the automaker conducted with instrumented Part 572 test dummies and the 15 mile-per-hour impact tests GM conducted with the body block in accordance with the requirements of Standard No. 203. IIHS said that it is difficult to make a straightforward comparison between the two tests because one involves use of a full-size test dummy representing a 50th percentile male while the other uses a simple hard rubber block representing only the upper torso and head of a human. In addition, IIHS stated that the force/deflection characteristics of the test dummy and the torso block are significantly different.

The agency believes that of the two tests, the 30 mile-per-hour sled test conducted by GM is more representative of an actual vehicle crash. In GM's sled test, the unrestrained test dummy was placed on a vehicle seat behind the steering column as in an actual vehicle. In the simplified 15 mile-per-hour test of Standard No. 203, the torso block is accelerated toward the column, usually by a pendulum, and then released to strike the column.

Equally important, the anthropomorphic test dummy specified in Part 572 of the agency's regulations is more representative of a human than the torso block used in Standard No. 203. The simplified torso block was developed before human-like test dummies were available, The area representing the chest of the torso block is significantly harder and stiffer than a human chest. As a result of that hardness and stiffness, an impact with that surface is more likely to produce the sudden, short increases in acceleration than is a more flexible surface designed to be similar to the human chest. The chest of the Part 572 anthropomorphic test dummy is based on testing done with cadavers and human volunteers and thus is more representative of the actual human chest. Thus, the agency believes that the GM testing is a better measure of the forces that would be imposed on a driver's chest in an actual crash. As explained more fully below, the agency is considering changes to Standard No. 203 that would improve its test procedures and requirements.

IIHS's second objection was that GM had not demonstrated that the Part 572 dummy and the injury criteria used in GM's testing are suitable for assessing whether the forces generated in the testing are likely to be injurious. IIHS said that the Part 572 dummy was designed specifically with the air bag in mind, which distributes forces over a large area to reduce injuries, and was not designed to be sensitive to the effects of large concentrated loads. IIHS and CFAS both emphasized that concentrated forces are known injury producers.

The Part 572 test dummy was designed to be used in the automatic restraint system testing of Standard No. 208, *Occupant Crash Protection*. During and after its development, the test dummy has been used extensively to measure loads generated by automatic and conventional belt systems as well as air bag systems. The injury criterion used in the GM testing is the same as the chest injury criterion adopted in Standard No. 208. At present, the Part 572 test dummy and the Standard No. 208 chest injury criterion are the only generally recognized and accepted measures of potential injury to the chest. The data from the GM testing, using available test dummies, show that the resultant acceleration measured in the chest were within the limits set by the agency in Standard No. 208. Thus, the agency concludes that based on available data, the short duration forces experienced in the Standard No. 203 impact test do not pose an unreasonable risk of injury.

Future Rulemaking

Several commenters requested the agency to make several technical and other amendments to the standard. GM requested the agency to amend the standard to adopt the updated version of the Society of Automotive Engineers recommended practice currently incorporated in Standard No. 203. Volkswagen recommended that the agency consider, for reasons of international harmonization, modifying the standard to adopt the alternative head impact test procedure contained in the European regulation on steering columns, Economic Commission for Europe Regulation 12.

IIHS and CFAS both criticized the agency for not upgrading the performance requirements of the standard and urged the agency to do so quickly. IIHS devoted a substantial portion of its submission to changes in the test procedures and requirements for the standard. Ford said that, before making any changes to the standard, the agency should determine whether any changes would compromise the field performance of current steering systems.

As mentioned in the notice of proposed rulemaking for this rule, the agency actively is considering possible improvements to Standard No. 203. The agency agrees, as Ford pointed out, that steering columns meeting Standard No. 203 have been proven to be injury reducers. However, the agency's technical report (Publication No. DOT HS 805-705) evaluating Standard No. 203 and Standard No. 204, *Steering Column Rearward Displacement*, also suggested areas for improving the standards. The agency will consider CFAS's, GM's, IIHS's, and Volkswagen's suggested changes during the process of evaluating possible changes to the standard.

At present, a number of research projects are being conducted for the agency on energy-absorbing steering columns. For example, Calspan is conducting a special study (contract DTNH22-80-C-07450) of data gathered during the National Crash Severity Study. The study is identifying conditions leading to both more and less successful operation of energy-absorbing steering columns, determining the relationship of energy-absorbing column compression and column intrusion to injury severity and comparing performance between specific energy-absorbing column designs. The agency is also working with Minicars, Inc., to conduct static and dynamic testing of steering columns to rate their protective capability. Based on the Calspan, Minicar and other research, the agency will make a determination of what, if any, changes to propose to the standard.

Issued on October 5, 1982.

Raymond A. Peck, Jr.
Administrator
47 F.R. 47840
October 28, 1982

MOTOR VEHICLE SAFETY STANDARD NO. 203

Impact Protection for the Driver from the Steering Control System—Passenger Cars

(Docket Nos. 2 and 3; Notice 1)

S1. Purpose and scope. This standard specifies requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact.

S2. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. However, it does not apply to vehicles that conform to the frontal barrier crash requirements (S5.1) of Standard No. 208 (49 CFR 571.208) by means of other than seat belt assemblies. It also does not apply to walk-in vans.

S3. Definitions. "Steering control system" means the basic steering mechanism and its associated trim hardware, including any portion of a steering column assembly that provides energy absorption upon impact.

S4. Requirements. Each passenger car and each multipurpose passenger vehicle, truck and bus with a GVWR of 10,000 pounds or less manufactured on or after September 1, 1981, shall meet the requirements of S5.1 and S5.2.

S4.1 Except as provided in S4.2, when the steering control system is impacted by a body block in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965 or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds.

S4.2 A Type 2 seat belt assembly that conforms to Motor Vehicle Safety Standard No. 209 shall be installed for the driver of any vehicle with forward control configuration that does not meet the requirements of S4.1.

S4.3 The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

S5. Impact protection requirements.

S5.1 [When the steering control system is impacted in accordance with Society of Automotive Engineers Recommended Practice J944, "Steering Wheel Assembly Laboratory Test Procedure," December 1965, or an approved equivalent, at a relative velocity of 15 miles per hour, the impact force developed on the chest of the body block transmitted to the steering control system shall not exceed 2,500 pounds, except for intervals whose cumulative duration is not more than 3 milliseconds. (47 F.R. 47840—October 22, 1982. Effective: December 2, 1982)]

S5.2 The steering control system shall be so constructed that no components or attachments, including horn actuating mechanisms and trim hardware, can catch the driver's clothing or jewelry during normal driving maneuvers.

Interpretation

The term "Jewelry" in paragraph S4.3 refers to watches, rings, and bracelets without loosely attached or dangling members.

32 F.R. 2414
February 3, 1967

PREAMBLE TO AMENDMENTS TO MOTOR VEHICLE SAFETY STANDARDS NO. 204

Steering Control Rearward Displacement

(Docket No. 78-116; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Federal Motor Vehicle Safety Standards Nos. 201, 203 and 204 to extend their applicability to light trucks, buses and multipurpose passenger vehicles (MPV's). The notice is issued in response to the rising death and injury toll involving these vehicles and to petitions by the Center for Auto Safety and the Insurance Institute for Highway Safety requesting that these standards be extended to those vehicles. Applying these standards to light trucks, buses and MPV's will reduce occupant deaths and injuries in those vehicles by requiring the use of energy absorbing material on such interior components as the instrument panel and seat backs (Standard No. 201), by limiting the amount of force that can be exerted on the driver's chest by the steering wheel in frontal crashes (Standard No. 203), and by limiting the rearward movement of the steering assembly in frontal crashes (Standard No. 204).

EFFECTIVE DATE: The effective date for the extension of applicability of Standards Nos. 201, 203 and 204 is September 1, 1981.

ADDRESS: Petitions for reconsideration should refer to the docket number and be submitted to: Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

SUPPLEMENTARY INFORMATION: This notice amends Standard No. 201, *Occupant Protection in Interior Impact,* and Standard No. 203, *Impact Protection for the Driver From the Steering Control System,* to extend the applicability of those standards to trucks, buses and multipurpose passenger vehicles (MPV's) with a gross vehicle weight rating (GVWR) of 10,000 pounds or less. This notice also amends Standard No. 204, *Steering Control Rearward Displacement,* to extend its applicability to trucks, buses and MPV's with an unloaded vehicle weight of 4,000 pounds or less, instead of all trucks, buses and MPV's with a GVWR of 10,000 pounds or less, as originally proposed in the agency's November 9, 1978, notice of proposed rulemaking (43 FR 52264). As explained below, the agency is initially limiting the extended applicability of Standard No. 204 while it studies methods for dealing with final-stage manufacturer certification difficulties. Similar possible problems with Standard No. 212-76, *Windshield Mounting,* and Standard No. 219-75, *Windshield Zone Intrusion,* led the agency to propose changes in the testing procedures for those standards (44 FR 45426).

For the purposes of Standard No. 204, the agency has determined that these problems would not be encountered in applying the standard to vehicles with an unloaded vehicle weight of 4,000 pounds or less and testing them at their unloaded vehicle weight. Approximately 75 percent of the current sales of light trucks, buses and MPV's with a GVWR of 10,000 pounds or less have an unloaded vehicle weight of 4,000 pounds or less.

This final rule was preceded by a notice proposing the extension of the applicability of Standards

Nos. 201, 203 and 204 in November 1978 (43 FR 52264). Private citizens, safety organizations, manufacturers and a manufacturer trade association submitted comments on the proposal. NHTSA has considered all of those comments and the most significant ones are discussed below.

Safety Need

Citing the need to reduce the number of deaths and injuries in light trucks, buses and MPV's, the American Automobile Association, the Center for Auto Safety, the Insurance Institute for Highway Safety and State Farm Insurance Companies supported application of the standards to those vehicles.

Although it did not object to extending the applicability of Standard Nos. 201, 203 and 204 to light trucks, buses and MPV's, General Motors argued that manufacturers should be given a longer lead time to comply with the standards because of the lack of urgent safety need. GM said that allowing a longer leadtime was desirable to ensure compliance, "without costly accelerated [design] programs." Using data from the agency's "Explanation of Rulemaking," GM said that light trucks, buses and MPV's have a fatality rate of 22.4 fatalities per billion miles, compared with a rate of 25.3 fatalities per billion miles for passenger cars. The data GM used covers fatalities during 1977 in all model year vehicles. A new analysis done by NHTSA of 1977 fatalities, reported by the agency's Fatal Accident Reporting System, shows that although older model year light trucks, buses and MPV's may have had a lower fatality rate than passenger cars, beginning with the 1973 model year, the combined fatality rate for light trucks, buses and MPV's began surpassing that of passenger cars. The analysis shows that recent model year passenger cars have a considerably lower fatality rate than light trucks, buses and MPV's. (A copy of that analysis has been placed in the docket.)

In addition to being higher than the combined fatality rate for all sizes of passenger cars, the combined fatality rate of light trucks, buses and MPV's is far higher than the rate for full-size passenger cars, Full-size cars are typically the safest of cars and many of them are comparable in size and weight to light trucks, buses and MPV's. In theory, occupants of larger and heavier vehicles, such as trucks, buses and MPV's, should experience less harmful crash forces, and thus presumably incur fewer or less severe injuries, than occupants of smaller lighter vehicles. Volkswagen has previously objected to a comparison of full-size passenger fatality rates with those for vans, arrguing that vans are comparable in weight to intermediate, not full-size passenger cars. Although the unloaded weight of vans and intermediate-size passenger cars may be comparable, vans have a higher gross vehicle weight rating which means that those vehicles can, in actual use, be loaded with substantially more weight than intermediate and even full-size passenger cars.

Volkswagen also questioned the safety need for the proposed reulmaking because of the voluntary compliance by VW and some other companies with the standards. Although the voluntary effort by some companies is commendable, most manufacturers do not comply with all of the standards in all of their vehicles. Some of the manufacturers who have taken steps to comply with the standard presumably were in part motivvated by prior NHTSA rulemaking notices proposing to apply Standards Nos. 201,203 and 204 to light trucks, buses and MPV's (35 FR 14936, 14936 and 16805). In the absence of a regulation, there is no assurance that non-complying manufacturers will produce complying vehicles and that manfacturers producing currently complying vehicles will continue to comply. Manufacturers who currently comply should experience only minor economic impacts, such as conducting certification tests as a result of compelling other manufacturers to comply.

Effectiveness

The Motor Vehicle Manufacturers Association (MVMA) questioned the potential effectiveness of Standards Nos. 201, 203 and 204. MVMA argue that a study done bySherman and Huelke of light truck and van accidents found that the standards would have little effect in those vehicles. However, a NHTSA analysis of the crashes reviewed by Sherman and Huelke found that a number of the crashes clearly edmonstrated the benefits of equipping light trucks and vans with energy absorbing instrument panels and steering columns and devices to limit the rearward displacement of the steering column. For example, Sherman and Huelke studied a 15-20 mph head-on crash of a 1976 Chevrolet

pickup truck into a tree. The Chevrolet was equipped with a padded instrument panel, and energy-absorbing steering column and a device to limit the rearward displacement of the steering column. They reported, "the results of this case show that both of the major energy absorbing components appeared to have completely activated, both by the vehicle crash and driver impact, providing maximum benefit to the driver. Had this vehicle been one of the other vehicle cases discussed in this section, we feel that the injuries sustained by the driver would have been much more severe."

NHTSA believes further that the Sherman and Huelke study provides information indicating that there is a need for even more improvements in light trucks and vans, such as providing energy-absorbing padding for the lower instrument panel. The agency is studying the question of making appropriate changes in the performance requirements of the standards to require more protection. However, NHTSA considers it important not to delay extending the current benefits of Standards Nos. 201, 203 and 204 while it reviews possible changes to the standards.

MVMA also argued that a comparison of the injury experience of passenger car steering assemblies with the experience of steering assemblies in light trucks and vans shows that Standards Nos. 203 and 204 "would provide little benefit" in those vehicles. Using data from the agency's original analysis of the injury experience of passenger cars produced before and after Standards Nos. 203 and 204 took effect, MVMA said that the primary benefit of the standards is to reduce moderate instead of severe-to-fatal injuries. It pointed out that 65.6 percent of the steering assembly related injuries in pre-standard cars were minor, 22.7 percent were moderate and 11.9 percent were severe-to-fatal. In post-standard, cars 78.8 percent of the steering assembly related injuries were minor, 10.2 percent were moderate and 11.0 were severe-to-fatal. Thus, in post-standard cars, many previously moderate injuries were only minor injuries. Using data from a Calspan study of light truck and van injuries, MVMA said that 83.5 percent of the steering column related injuries in those vehicles are minor, 4.1 percent are moderate and 12.4 percent are severe-to-fatal. MVMA said that the Calspan data indicate that there is "little room" for a passenger car-type of injury experience change from moderate to minor injuries in light trucks and vans.

However, the Calspan data cited by MVMA are not comparable with the NHTSA data and probably underestimate the percentage of moderate and severe-to-fatal steering assembly related injuries in light trucks and vans. The Calspan data include injuries from all types of impacts (front, rear and side). The NHTSA data, on the other hand, cover only frontal crashes, the type of crashes which are most likely to cause severe-to-fatal steering assembly related injuries. Thus, the percentage of moderate and severe-to-fatal injuries found in the NHTSA data should be greater. In addition, an updated NHTSA analysis of passenger car injury experience, discussed below, shows that Standards Nos. 203 and 204 are effective in reducing both moderate and severe-to-fatal injuries. Further, even if the actual light truck and van injury distribution were the same as found by Calspan, Standards Nos. 203 and 204 would be effective in reducing the number of severe-to-fatal injuries.

Several manufacturers and the MVMA objected to the agency's use of passenger car data to estimate the potential effectiveness of the three standards in light trucks, buses and MPV's. They argued that the agency should instead have conducted a study comparing the accident experience of light trucks, buses and MPV's that currently comply with the standards with the experience of those that do not comply. As explained below, NHTSA concludes that such a study is impractical and that the agency's original and updated analyses of passenger car effectiveness data are valid and support application of the standards to light trucks, buses and MPV's.

The primary difficulty in conducting a study of current light trucks, buses and MPV's is that there is no conclusive information identifying which vehicles are currently in compliance with the standard, since no manufacturer is required to certify compliance. For example, International Harvester (IH) requested NHTSA to conduct a study of currently complying light trucks, buses and MPV's, saying that its Scout models were designed to comply with the performance requirements of Standards Nos. 201, 203 and 204. However, IH said that if the NHTSA applies the

standards to light trucks, buses and MPV's, it will have to retest the Scout, which "could conceivably require some additional redesigning for compliance assurance." NHTSA belives that the analysis the agency conducted of pre- and post-1968 passenger car injury experience, where it was known that passenger cars manufactured on or after January 1, 1968, had to comply with Standards Nos. 201, 203 and 204, provides a sound basis for estimating the potential effectiveness of the standards in other types of vehicles.

Using information recently made available from the agency's National Crash Severity Study, NHTSA has again compared injuries sustained by occupants of cars manufactured before Standards Nos. 201, 203 and 204 went into effect with injuries sustained by occupants of cars manufactured after the standards went into effect. As with the agency's first analysis, cited in the November 9, 1978, notice for this rulemaking, the new analysis examined injuries caused by components covered by Standard No. 201, such as instrument panels, seat backs, arm rests and sun visors. The analysis found that Standard No. 201 reduced severe to fatal occupant injuries (i.e., injuries with an abbreviated injury scale ranking of 3 or more) by approximately 38 percent. The analysis also found that the probability of an occupant injured in a crash being injured by a component covered by Standard No. 201 was 25.7 percent. Thus, multiplying the probability of injury (i.e., 25.7 percent) by the effectiveness of the standard in reducing serious and fatal injuries (i.e., 38 percent) the analysis estimated that the overall reduction in severe to fatal injuries attributable to Standard No. 201 is 9.3 percent.

A similar comparison was made for occupant injuries in cars manufactured before and after Standards Nos. 203 and 204 went into effect. The comparison examined two sets of driver injuries that occurred in frontal crashes. One set consisted of injuries that could be specifically attributed to contact with the steering assembly; the other set consisted of neck, chest and abdominal injuries sustained by drivers in frontal crashes, the types of steering assembly-related injuries the standards are designed to reduce. The comparison found that Standards Nos. 203 and 204 reduced severe to fatal injuries by an average of 20.9 percent. The probability of an injured driver receiving an injury attributable to the steering assembly was an average of 19.4 percent. The analysis estimated that Standards Nos. 203 and 204 produced an overall average reduction of 3.7 percent in severe to fatal driver injuries.

Loading Requirements

At present, Standared No. 204 does not specify the loading requirements for vehicles in the 30 mph fixed barrier crash test required by the standard. In conducting Standard No. 204 compliance tests for passenger cars, the agency has loaded passenger cars to their unloaded vehicle weight (i.e., the weight of the vehicle with all the fluid, such as gas, oil and water, necessary for its operation but without any occupants or cargo). This is the least severe loading condition used in the Federal Motor Vehicle Safety Standards that involve crash testing. This notice makes a technical amendment to Standard No. 204 to incorporate the agency long-standing loading practices. Those practices were publicly announced in the compliance test procedures publicly released by the agency when Standard No. 204 first went into effect in 1968. Passenger car certification information provided by manufacturers to NHTSA shows that they have consistently used unloaded vehicle weight as the loading condition in their testing. In some instances, manufacturers have voluntarily used more severe loading conditions in their certification testing.

Commerical Vehicles

Several final stage manufacturers and United Parcel Service requested the agency to exempt vehicles used in commercial applications from the standards. A similar exemption has previously been sought by the Truck Body and Equipment Association (TBEA) for Standard No. 212-76, *Windshield Mounting,* and Standard 219-75, *Windshield Zone Intrusion.* As with the TBEA request, NHTSA concludes that such an exemption should not be adopted since it is not in the interest of safety and is based on vehicle use instead of vehicle type. Such an exemption would mean that standards would be applied on the basis of the commercial or private use of the vehicle and not upon the safety needs of a particular vehicle type. Since the safety needs of similar vehicles usually are similar, it would be inappropriate to treat one set of vehicles differently merely because they are used commercially.

The National Traffic and Motor Vehicle Safety Act contemplates the application of the standards based on vehicle type instead of vehicle use. Basing a standard on vehicle use would present this agency with difficult enforcement problems. It would also place a manufacturer in the difficult position of having to assess in advance the potential future use of the vehicle it produces. In addition, basing standards application on vehicle use does not recognize that a vehicle may have two or more uses during its lifetime.

For all these reasons, the agency concludes that applying standards based on vehicle use would not be appropriate.

Walk-In Vans

GM, MVMA and several final-stage manufacturers requested the agency to exempt walk-in vans (i.e., the "step-van" city delivery type of vehicle that permits a person to enter the vehicle without stooping) from Standards Nos. 201, 203 and 204. In the case of Standard No. 201, they argued that this type of vehicle frequently has none of the components covered by the standard, such as arm rests, sun visors and instrument panels to the right of the steering assembly. However, those vehicles do have an instrument panel in front of the driver and some walk-in vans do have a front passenger seat and an instrument panel in front of that seat which may be struck by an occupant during a crash. Applying Standard No. 201 to those vehicles will require the instrument panel to be padded to cushion occupant impacts. Based on the proven effectiveness of Standard No. 201 in passenger cars, the agency is extending the performance requirements of the standard to include walk-in vans and MPV's.

The manufacturers argued that walk-in vans should be exempt from Standards Nos. 203 and 204 also. They said that the driver steering assembly configuration found in walk-in vans makes it improbable that compliance with the standard will reduce drivers' injuries. They noted that the steering column is mounted in those vehicles at an angle of 55-60 degrees, compared to the mounting angle of 30 degrees found in conventional trucks, and the columns in walk-in vans move upward rather than rearward in a crash. The manufacturers also argued that these vehicles are generally used in urban areas, where there is more slow speed traffic than in rural areas. They pointed out that because of these factors, the agency has previously exempted walk-in vans from Standards Nos. 212–76, *Windshield Retention,* and 219–75, *Windshields Zone Intrusion.* The agency agrees that current energy absorbing steering column designs probably would provide little, if any, protection in walk-in vans because of their uniques driver/steering column configuration, and thus is exempting walk-in vans for the present.

Belts in Forward Control Vehicles

Although they did not object to requiring lap-shoulder belts in forward control vehicles as proposed in the agency's November 9, 1978 notice, several manufacturers and the MVMA objected to what they interpreted as a conflict between the agency's proposal and the current requirements of Standard No. 208, *Occupant Crash Protection.* They argued that the agency's proposal not only would require lap and shoulder belts in forward control vehicles, but would also require such belts in open-body vehicles, convertibles and walk-in vans, which currently only have to have lap belts. The agency's proposal was directed only toward forward control vehicles and was meant to supersede the current requirements for those vehicles set in Standard No. 208. For organizational simplicity, the agency is making a technical amendment to Standard No. 208 so that all belt requirements are centralized in that standard. The amendment only adopts the proposed change to the forward control vehicle belt requirements. It does not change the current belt requirements for open-body vehicles, convertibles and walk-in vans.

MVMA requested the agency to require lap and shoulder belts in forward control vehicles for only one model year. MVMA did not provide any justification for that request. NHTSA believes that the important protection of lap and shoulder belts should be available to all forward control vehicles manufactured on or after September 1, 1981, and declines to adopt the MVMA request.

Upgrading of Standard

In their comments, the Center for Auto Safety and the Insurance Institute for Highway Safety renewed their requests that the agency set new performance requirements for Standard No. 203 to provide additional protection in angular impacts. The agency has conducted some preliminary testing to determine what additional requirements

may be appropriate to increase protection in angular impacts. In addition, the agency's National Center for Statistics and Analysis has recently begun a special study to collect accident data on 1973 and later model vehicles to gather additional information on the effectiveness of energy absorbing steering assemblies in angular and other crashes. Based on that data, NHTSA will make a determination of what further changes are needed in the standard.

The American Automobile Association asked the agency to delay application of Standard No. 203 until upgraded performance requirements are developed. However, because the agency does not want to delay providing the occupants of light trucks, buses and MPV's with the safety benefits of Standard No. 203, the agency is extending the standards to those vehicles while it continues to consider the feasibility of additional performance requirements.

NHTSA is also considering possible additional requirements for Standard No. 201. The agency has scheduled a meeting for December 11, 1979, so that the public can present its views and ideas on ways of improving protection for children involved in vehicle collisions. In the September 4, 1979, notice announcing the meeting, the agency specifically asked for comments on possible improvements to the interior padding of vehicles to provide additional protection for children (44 FR 51623).

Heavy Trucks

In the November 9, 1978 notice, NHTSA announced that it was evaluating whether to extend the applicability of Standards Nos. 201, 203 and 204 to heavy trucks (i.e., trucks with a GVWR of more than 10,000 pounds) and solicited comments on appropriate performance requirements for those vehicles. In their comments, the Motor Vehicle Manufacturers Association, Freightliner and International Harvester all opposed an extension of the standards to trucks with a GVWR greater than 10,000 pounds, arguing that there is no data showing a safety need for applying the standards to those vehicles. They also argued that because of the size and weight of heavy trucks, occupants in these vehicles do not experience the same energy transfers in a crash than passenger car occupants experience and thus theoretically should incur fewer or less severe injuries. At the agency's recent meeting on heavy truck safety, several participants provided information on the need for greater crash protection for drivers of heavy trucks. NHTSA is currently analyzing that information to determine what additional heavy truck regulatory action may be needed.

Miscellaneous Comments

MVMA pointed out that Standard No. 201 currently requires two sun visors in a vehicle and requested that a second visor not be required if there is no front passenger seat. NHTSA agrees that such a change is appropriate and has made the necessary amendment to the standard.

Jeep Corp. objected to the application of Standard No. 201 to open-body MPV's, arguing that for Jeep to locate padding in the expected head impact area it would have to raise its padding or lower its seat, both of which it claimed would interfere with the driver's forward visibility. Jeep's comment appears to reflect a misunderstanding of Standard No. 201. The performance requirements of the standard only apply to areas of the instrument panel that are within the head impact area of each designated seating position. (The head impact area is the portion of the vehicle's interior that can be contacted by a headform representing an occupant's head.) Thus, if a portion of Jeep's vehicle instrument panel is not within the head impact area, it does not have to comply. For portions of the panel that are within the head impact area, Jeep can make structural changes to the instrument panel to meet Standard No. 201 without adding additional padding. Therefore, Jeep's requested exemption for all open-body vehicles is denied.

One final stage manufacturer, Boyertown Auto Body Works, asked NHTSA whether its driver side instrument panel was within the exceptions to Standard No. 201 and, if not, sought to have its instrument panel construed to be a console assembly, which is exempt from the standard. Such an interpretation is not acceptable since Boyertown clearly labels the area in question as an instrument panel in its engineering drawings. However, according to the engineering drawing provided by Boyertown, the limited section on the instrument panel of concern to Boyertown is within the area exempted by S3.1.1(d) of the standard. That section provides that the area of the interior immediately forward of the steering column is exempt from the standard.

Costs and Leadtime

NHTSA has considered the economic and other impacts of this final rule and determined that they are not significant within the meaning of Executive Order 12044 and the Department of Transportation's policies and procedures for implementing that order. The agency's assessment of the benefits and economic consequences of this proposal are contained in a regulatory evaluation which has been places in the public docket. As explained previously, copies of the regulatory evaluation can be obtained by writing NHTSA's docket section at the address given in the beginning of this final rule.

As previously detailed in this notice, the agency has examined the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars and concluded that those standards have brought about a substantial reduction in overall injuries occurring to the passengers in those vehicles. Because they share the same driving environment as occupants in passenger cars, occupants in light trucks, buses and MPV's face a similar risk of injury posed by hazardous instrument panels and rigid steering columns. Based on its evaluation of the effectiveness of Standards Nos. 201, 203 and 204 in passenger cars, the agency has concluded that applying those standards to light trucks, buses and MPV's can result in a reduction of 120 to 240 fatalities and 4,400 to 8,900 serious injuries per year when all those vehicles comply with the standards.

The agency's cost estimate for meeting Standards Nos. 201, 203 and 204 in light trucks, buses and MPV's take into account that many manufacturers have equipped some of their vehicles with components designed to meet the performance requirements of the standards. Those components may need little or no redesigning to fully comply with the standards. For example, American Motors, Chrysler, Ford, General Motors, International Harvester and Volkswagen commented that some, if not all, of their vehicles currently have components designed to comply with the standards or they will install such components in some of their vehicles by the 1981 model year.

Only two manufacturers, Nissan and Ford, provided any information about the costs associated with complying with the standards. Nissan said that the cost associated with complying with all three standards was $30. Ford estimated the cost for compliance with Standard No. 201 as $10 per vehicle; based on preliminary design assumptions, Ford put the cost of complying with Standards Nos. 203 and 204 in its van-type trucks, buses and MPV's at $120 per vehicle.

To provide the agency with additional information about the estimated costs of complying with the three standards, NHTSA contracted with the John Z. DeLorean Corp. to evaluate current vehicles and determine what changes would be needed to bring the vehicles into compliance, Bases on its review of current foreign and domestic light trucks, buses and MPV's, DeLorean concluded that the total cost of compliance with the three standards would add a sales weighted average of $16 to the retail price of those vehicles. The DeLorean study reported that the vehicles requiring the most changes to meet Standards Nos. 201, 203 and 204 were van-type trucks, buses and MPV's made by GM and Ford. DeLorean estimated that GM and Ford van-types vehicles would require a $27 increase in consumer price to comply with Standards Nos. 203 and 204 and a price increase ranging between $6 and $15 to comply with Standard No. 201. The agency believes that the substantial difference between DeLorean's and Ford's estimate of the cost of compliance with Standards Nos. 203 and 204 may be due to Ford's overestimate of the anticipated changes needed in the vehicles based on its preliminary design asssumptions.

The agency's November 1978 notice proposed an effective date of September 1, 1980, for Standard No. 201 for all vehicles and for Standards Nos. 203 and 204 for nonforward control vehicles. An effective date of September 1, 1981, was proposed for Standards Nos. 203 and 204 for forward control vehicles to allow manufacturers additional time to make the necessary changes in those vehicles. In their comments on Standard 201, Chrysler and Ford said they could meet the standard in all their vehicles by the proposed effective date. Nissan, Toyo Kogyo and International Harvester (IH) requested from 18 to 24 months leadtime. General Motors requested 2½ years' leadtime and American Motors requested 3 years. As a part of its NHTSA-funded study of the costs of complying with the standard, the DeLorean Corp. also examined the leadtime necessary to comply with

the standard. For Standard No. 201, the DeLorean study concluded that only one year was needed for all vehicles except van-type trucks, buses and MPV's manufactured by Chrysler and GM, which needed two years.

For Standards Nos. 203 and 204, Chrysler said that all its vehicles, except its incomplete forward control van-type vehicles, can comply by September 1, 1980. Chrysler did not provide an estimate of leadtime needed for its incomplete forward control vans. Nissan, Toyo Kogyo and IH requested from 18 to 24 months leadtime. Ford said its 1980 model year F-series trucks and Bronco models would comply with the standards and the Courier truck chassis cab imported by Ford would comply by September 1, 1981. Ford requested until September 1, 1982, for its van-type trucks, buses and MPV's. General Motors requested 2½ years for all its vehicles and American Motors requested three years.

The DeLorean study concluded that 18–24 months of leadtime was needed for all models, except those made by Ford, which would require three years. DeLorean made its estimate of leadtime for Ford based on an assumption that Ford would need extra steering assembly tooling facilities. However, since Ford plans to introduce complying components on its 1980 model F series trucks and Bronco models, Ford has apparently developed the needed tooling capacity.

Based on its analysis of the DeLorean study and of the industry's comments, NHTSA concludes that setting an effective date of September 1, 1981, will allow sufficient time for all manufacturers to comply with the standards. This action provides an additional year for all light trucks, buses and MPV's to meet Standard No. 201 and for nonforward control vehicles to meet Standards Nos. 203 and 204.

The principal authors of this notice are William Smith, Office of Vehicle Safety Standards, and Stephen Oesch, Office of Chief Counsel.

Issued on November 12, 1979.

Joan Claybrook
Administrator

44 F.R. 68470
November 29, 1979

PREAMBLE TO AN AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 204

Steering Control Rearward Displacement—Passenger Cars

(Docket No. 3)

ACTION: Final rule; correction.

SUMMARY: On November 29, 1979, NHTSA published in the Federal Register a final rule extending the applicability of Standard No. 204, *Steering Control Rearward Displacement,* to light trucks, buses and multipurpose passenger vehicles with an unloaded vehicle weight of 4,000 pounds or less (44 FR 68470). In amendment number 5 on page 68475 describing the changes made to Standard No. 204, the notice said that a new section S6 was added to the standard. However, the notice did not provide the text for a new section S6. The reference to a new section S6 is an error. No such section was to be added to Standard No. 204. The purpose of this correction is to make clear that the only changes to Standard No. 204 are the amendments to sections S2 and S4 and the addition of a new section S5. All of those changes are fully described on page 68475 of the November 29, 1979, Federal Register notice.

FOR FURTHER INFORMATION CONTACT:

Mr. William Smith, Office of Vehicle Safety Standards, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590 (202-426-2242)

Issued on January 28, 1980.

Michael M. Finkelstein
Associate Administrator
for Rulemaking

45 F.R. 7551
February 4, 1980

MOTOR VEHICLE SAFETY STANDARD NO. 204

Steering Control Rearward Displacement—Passenger Cars Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 3)

S1. Purpose and scope. This standard specifies requirements limiting the rearward displacement of the steering control into the passenger compartment to reduce the likelihood of chest, neck, or head injury.

S2. Application. This standard applies to passenger cars and to multipurpose passenger vehicles, trucks and buses with a GVWR of 10,000 pounds or less. However, it does not apply to walk-in vans.

S3. Definitions.

"Steering column" means a structural housing that surrounds a steering shaft.

"Steering shaft" means a component that transmits steering torque from the steering wheel to the steering gear.

S4. Requirements. Each passenger car and each multipurpose passenger vehicle, truck and bus with an unloaded weight of 4,000 pounds or less manufactured on or after September 1, 1981, shall meet the requirements of S5.1.

S5. Rearward displacement requirements.

S5.1 The upper end of the steering column and shaft shall not be displaced horizontally rearward parallel to the longitudinal axis of the vehicle relative to an undisturbed point on the vehicle more than 5 inches, determined by dynamic measurement, when the vehicle, loaded to its unloaded vehicle weight, is impacted perpendicularly into a fixed collision barrier at a forward longitudinal velocity of 30 miles per hour.

Interpretations

(1) When conducting the barrier collision test, a driver dummy may be used without measuring the impact force developed on the chest.

(2) In the event that the vehicle impacts the barrier at a velocity not less than 30 miles per hour nor more than 33 miles per hour, the displacement of the steering column may be corrected to 30 miles per hour by means of the following formula:

$$\frac{D_1}{D_2} = \frac{V_1^2}{V_2^2}$$

32 F.R. 2414
February 3, 1967

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials—Passenger Cars, Multipurpose Vehicles, Motorcycles, Trucks, and Buses

(Docket No. 9)

Motor Vehicle Safety Standard No. 205 (32 F.R. 2414) as amended (32 F.R. 10072) specifies requirements for glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks, and buses.

As a result of inquiries seeking clarification of the applicability of the Federal motor vehicle safety standards to campers, a ruling was published in the *Federal Register* on March 26, 1968 (FHWA Ruling 68–1) (33 F.R. 5020) which specified that the glazing standard is applicable to slide-in campers because they are items of motor vehicle equipment for use in motor vehicles and to chassis-mount campers.

The glazing standard requires that glazing materials "conform to the United States of America Standards Institute 'American Standard Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,' ASA Standard Z26.1—1966." As a result, windshields and forward facing windows are required to be AS1 laminated glass.

The Federal Highway Administration has received petitions for rule making requesting that forward facing windows on campers be allowed to use AS2 or AS3 laminated glass which is able to meet the Z26.1–1966 penetration resistance test, No. 26, required of AS1 type glass. The requests point out that AS1 type glass which is presently required for forward facing windows in campers is unduly expensive and unnecessary for campers because AS1 type glass must meet stringent optical tests. The petitioners argue that forward facing windows on campers should not have to meet these stringent optical tests because the windows are not used for driver visibility.

The Administrator has determined that granting the petitions would not reduce the protection afforded the public by the standard. Accordingly the glazing standard is being amended to allow AS2 or AS3 laminated glass in forward facing windows of campers if the glass is able to meet the penetration resistance test. The amendment will require that forward facing windows in campers conform to AS1 type laminated safety glass; or AS2 type laminated safety glass that meets Test 26 of Z26.1–1966; or AS3 type laminated safety glass that meets the requirements of Test 26 of Z26.1–1966. The latter two glazing materials will be identified by the characters AS2–26 and AS3–26 respectively.

The Federal Highway Administration has received a petition for rule making requesting that Standard No. 205 be amended so that paragraph S3.2 Edges be changed to provide that exposed edges must meet the Society of Automotive Engineers Recommended Practice J673a, Automotive Glazing, August 1967, instead of the SAE Recommended Practice J673, Automotive Glazing, June 1960. The petition also requests that the words "except that the minimum edge radius dimension shall not be less than the nominal thickness of the glazing material" be deleted because this requirement is already included in the SAE Recommended Practice J673a. These requests would allow minor imperfections in edging that would not diminish the safety benefits derived from the requirements but would allow normal manufacturing tolerances. These requests are granted and Standard No. 205 is being amended accordingly.

The Administrator has received a petition concerning certification requirements for prime manufacturers of glazing materials; prime glazing material manufacturers being those who fabricate, laminate or temper glazing materials.

The Petitioner states that he has encountered practical problems in the use of certification labels because: (a) glass stored for appreciable lengths of time, covered by the label, may "weather" in a different manner from the remaining areas of the glass (b) labels on individual lights of glass can produce pressure points due to local area loading and may result in breakage during shipment and storage, and (c) certification labels can become separated from the material prior to delivery from consigned stock distributors to non-stocking distributors.

The Petitioner points out that Standard No. 205 requires marking of safety glazing materials in accordance with paragraph 6 of the United States of America Standards Institute (USASI) Standard Z26.1-1966. The Petitioner requests that the permanent marking on the glazing material required by Standard No. 205, with the addition of the symbol "DOT", be allowed as an alternative method of certification required under Section 114 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1401). This petition is granted provided that the symbol "DOT" and an approved two digit manufacturer's code number is included in the permanent marking. Any prime glazing material manufacturer may apply for an approved two digit manufacturer's code number assignment to the Director, National Highway Safety Bureau, Washington, D.C. 20591.

Since these amendments relieve restrictions, provide alternative means of compliance and create no additional burden the Administrator finds, for good cause shown, that it is in the public interest to make them effective upon date of issuance.

In consideration of the foregoing, Section 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 205 (32 F.R. 2414) as amended (32 F.R. 10072) is amended. . . .

These amendments are made under the authority of Sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 USC 1392, 1407) and the delegation of authority contained in section 1.4(c) of Part I of the Regulations of the Office of the Secretary (49 CFR 1.4(c)).

Issued in Washington, D.C., on September 13, 1968.

John R. Jamieson, Deputy
Federal Highway Administrator

33 F.R. 14162
September 19, 1968

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 23; Notice 2)

Motor Vehicle Safety Standard No. 205 specifies requirements for glazing materials for use in passenger cars, multipurpose passenger vehicles, motorcycles, trucks, and buses.

As a result of inquiries seeking clarification of the applicability of the Federal motor vehicle safety standards to campers, a ruling was published in the *Federal Register* on March 26, 1968 (33 F.R. 5020), which specified that the glazing standard (No. 205) is applicable to slide-in campers because they are items of motor vehicle equipment for use in motor vehicles.

Standard No. 205 requires, among other things, that glazing materials "conform to the United States of America Standards Institute 'American Standard Safety Code of Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,' ASA Standard Z26.1–1966" (hereafter Z26.1–1966).

By order published in the *Federal Register* on September 19, 1968 (33 F.R. 14162), section S3.2 of the Standard was amended to allow the use of AS2 or AS3 laminated glass in forward facing windows of campers provided such glass met the requirements of Test 26 of Z26.1–1966. On the assumption that Z26.1–1966, as incorporated in Standard No. 205, required the use of AS1 type laminated glass in forward facing windows of campers, the Administrator found that this amendment relieved restrictions, provided alternate means of compliance and created no additional burdens. Accordingly, the amendment was made effective immediately.

Thereafter, petitions for reconsideration were filed on the grounds, among others, that properly interpreted Z26.1–1966 permitted the use of AS1, AS2, AS3, AS4, and AS5 glazing material in forward facing camper windows and that, therefore, the September amendment did not relax an existing requirement but in fact imposed additional restrictions upon manufacturers by limiting the types of glazing materials allowable for use in such windows. Consequently, it is urged that notice of that amendment should have been given and interested parties afforded an opportunity to comment.

The Administrator recognizes that, prior to the issuance of the September amendment, Standard No. 205 as initially promulgated could have been reasonably interpreted as allowing the use of AS1, AS2, AS3, AS4, and AS5 glazing materials in the forward facing windows of campers, that many manufacturers could have reasonably acted in reliance upon such a reading, that a great deal of confusion concerning the requirements has and continues to exist and that, in fact, comments focusing directly upon the proper glazing materials required in forward facing windows of campers have not been specifically solicited by the Administration. In the light of all of these circumstances it is considered appropriate to revoke section S3.2—"Materials for use in forward facing windows of campers" of Federal Motor Vehicle Safety Standard No. 205, as amended (33 F.R. 14162), as well as any interpretation that would have required the use of AS1 glass only in forward facing camper windows. The net effect of this action is to permit, subject to further rulemaking action,[1] the use of glazing materials that petitioners represent are presently being used, i.e., AS1, AS2, AS3, AS4, and AS5 glazing materials referred to in Z26.1–1966.

Since this amendment relieves restrictions and creates no additional burden the Administrator finds good cause is shown that an effective date earlier than 180 days after issuance in the public interest and the amendment is made effective upon date of issuance.

In consideration of the foregoing, § 371.21 of Part 371, Federal Motor Vehicle Safety Standard No. 205 as amended (33 F.R. 14162) is amended by revoking S3.2—"Materials for use in forward facing windows of campers".

(Secs. 103, 119, National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407); delegation of authority contained in § 1.4(c) of Part 1 of the regulations of the Office of the Secretary (49 CFR 1.4(c))

Issued: February 27, 1969.

John R. Jamieson, Deputy
Federal Highway Administrator

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[1] See notice of proposed rule making published at 34 F.R. 3699, which proposes glazing requirements for forward facing windows of campers.

34 F.R. 3688
March 1, 1969

Effective: April 1, 1973
(Except as noted in the Rule)
Reissued: June 14, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 71–1; Notice 3)

The purpose of this notice is to amend Motor Vehicle Safety Standard No. 205, "Glazing Materials," to permit the use of certain plastic materials in motor vehicles in addition to those presently allowed; to modify the certification and labeling requirements; and to modify the test for the chemical resistance of plastic materials. It also clarifies the applicability of the standard to motor vehicle equipment, and the provisions of the standard dealing with readily removable windows.

Federal Motor Vehicle Safety Standard No. 205 was initially published February 3, 1967 (32 F.R. 2414), and amended July 8, 1967 (32 F.R. 10072), September 19, 1968 (33 F.R. 14162), and March 1, 1969 (34 F.R. 3688). On January 9, 1971, a notice of proposed rulemaking (Docket 71–1, Notice 1) was published based upon petitions for rulemaking received from the Eastman Chemical Products, Inc., and the California Highway Patrol. The former requested that the standard be amended to allow the use of butyrate plastic materials, and the latter requested changes in the requirements of the standard dealing with the marking of glazing materials. This amendment responds to both of these petitions and also modifies the standard as a result of independent agency action.

Standard No. 205 is applicable to "glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses and motorcycles." It is also applicable, under FHWA Ruling 68–1 (33 F.R. 5020, March 26, 1968), to glazing for use in slide-in and chassis-mount campers. This amendment to Standard No. 205 incorporates the substance of FHWA Ruling 68–1 into the applicability section of the standard and specifies, in accordance with the notice of March 1, 1969 (Docket 23; Notice 2, 34 F.R. 3688) the glazing materials that are permitted to be used in these equipment items.

The notice of January 9, 1971, proposed to revise the incorporation by reference of American Standards Association Test (ASA) Z26.1–1966 to include supplement Z26.1a–1969, March 7, 1969, and to reflect the change in the name of the American Standards Association to the American National Standards Institute. No objections were raised in the comments to these proposals, and they are incorporated into the standard by this amendment.

The notice proposed to modify the chemical resistance tests incorporated into the standard (Tests 19 and 20), by deleting carbon tetrachloride as a testing agent and by adding trichlorethylene. The tests are designed to test the resistance of plastic materials to chemicals that are commonly used to clean them. By this notice, carbon tetrachloride is deleted from the list of materials. As indicated in the notice of proposed rulemaking, the deletion is commensurate with the ban imposed by the Food and Drug Administration on this substance because of its high toxicity. At the same time, the NHTSA has decided not to include either trichlorethylene or freon in the list of testing agents. The comments have indicated that these substances are not commonly used as cleaning agents, and accordingly they are not used for test purposes.

The major revision proposed by the notice, based upon a petition for rulemaking from the Eastman Chemical Products Co., Inc., was to allow additional plastic materials to be used in motor vehicles. The petitioner claimed that the requested materials would meet any test to which other plastic materials are subjected, except for resistance to undiluted denatured alcohol (Formula SD 30), where a slight tackiness would occur. Rather than merely exempt these plastics from the alcohol resistance requirement, the notice suggested that they still be subjected to the same chemicals as other plastics, but that if structural integrity were maintained, a loss of transparency would be allowed. The notice for the same reason proposed not to subject these materials to the abrasion and weathering tests applied to other plastics. Instead, the proposal would have required labels to be affixed to the material specifying cleaning agents and instructions that would minimize loss of transparency, and would have restricted them to locations in motor vehicles where loss of transparency would not affect driver visibility.

Based upon information received during the rulemaking process, the NHTSA has determined that the materials in question exhibit characteristics which make them satisfactory from the standpoint of safety for use in certain motor vehicle applications. Many comments, however, opposed the approach taken by NHTSA in the proposed rule, and as a result the proposed requirements have been changed. The standard as now amended will provide that these materials not be required to show resistance to undiluted denatured alcohol if (1) they show resistance to the other chemicals presently specified as testing agents, (2) they can meet the other tests to which other plastic materials are subjected, and (3) they are used in only limited locations in the motor vehicle. In addition, they must be labeled, as proposed, with instructions regarding cleaning that will minimize a loss of transparency.

Some comments also objected to certain locations where the additional plastic materials would have been allowed to be used: specifically, auxiliary wind deflectors and folding doors. The comments suggested that transparency is an important characteristic for glazing used in these locations, and that materials not resistant to Formula SD 30 alcohol should not be used in them. The NHTSA has determined that these comments have merit, and has not permitted these materials to be used in the two locations.

The notice of proposed rulemaking would have required all interior mirrors, both rearview and vanity-type, to be constructed of glazing materials that meet the requirements of ANS Z26. As a result of comments received, the NHTSA has determined that the requirements should not be applied to interior mirrors. With regard to rearview mirrors, many are today constructed of annealed glass of a wedge shape, in the form of day/night mirrors. The comments have indicated that materials allowed to be used pursuant to ANS Z26 do not make satisfactory day/night mirrors. As these mirrors have clear safety advantages when used in night driving conditions, the NHTSA has determined that their elimination would not be in the best interests of safety. With reference to other vehicle interior mirrors, while the use of safety glazing in them is preferable, there is presently a lack of data which shows a compelling need for changing current industry practices. This is especially important where, as here, much of the equipment involved is not peculiarly adapted to motor vehicle usage. One particular type of mirror, a sun-visor mirror, falls within the purview of Motor Vehicle Safety Standard No. 201, "Occupant Protection in Interior Impact," and will be dealt with as part of that standard.

The notice of proposed rulemaking prescribed a scheme for the marking and certification of glazing materials which would have required prime glazing manufacturers to certify glazing materials by applying to the glazing material the symbol DOT and an appropriate code mark, together with the marking required by section 6 of ANS Z26. The proposal would have also required these markings to be in a specified format and in a specific location of the completed glazing. Other than primary manufacturers would have been required to certify the material by affixing the mark of the primary manufacturer.

As amended Standard No. 205 will require prime manufacturers to certify glazing material, as proposed, by adding to the markings required by section 6 of ANS Z26 the symbol DOT and a code mark obtained on application to the NHTSA. Those who as manufacturers or distributors cut glazing for use in motor vehicles from larger sheets are required to certify conformity to the standard in any way they choose, as long as the method chosen is consistent with Section 114 of the National Traffic and Motor

Vehicle Safety Act. One such method would be to affix a label to the completed piece of glazing containing a statement to the effect that the material conforms to Standard No. 205. The proposed requirement that such manufacturers label the material with the marking of the prime manufacturer has been deleted, as is the proposed requirement that would have required the markings to appear in a specified order, or in specific locations on the glazing material.

An issue arose during the period that this rulemaking was under consideration concerning the use of plastics in side windows of buses. General Motors has requested an interpretation of Standard No. 205 that would include within the definition of "readily-removable windows" emergency escape windows which can be pushed out, except for one side which is hinged to the window frame, without the use of any special tools. The NHTSA has concluded that the term "readily removable windows" includes windows of this design, and in this amendment so clarifies Standard No. 205.

Effective dates: The addition of glazing materials to those already allowed imposes no additional burdens on any person, and relieves restrictions on the types of glazing materials which can be used. That part of the amendment pertaining to the addition of these materials, paragraphs S5.1.1.2, S5.1.1.3, andS5.1.2, is effective upon publication of this notice in the *Federal Register.* Similarly, both the deletion of the test for chemical resistance of plastics to carbon tetrachloride in paragraph S5.1.1.1, and the clarification of "readily-removable windows" in S5.1.1.4 relieve restrictions, and the effective date of those amendments is the date of publication of this notice. The other amendments to the standard are effective April 1, 1973.

In light of the above, Motor Vehicle Safety Standard No. 205, appearing at 49 CFR section 571.205, is revised. . . .

This notice is issued pursuant to the authority of sections 103, 114, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1403, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on June 14 ,1972.

Douglas W. Toms
Administrator

37 F.R. 12237
June 21, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket 71–1; Notice 4)

This notice responds to petitions for reconsideration of an amendment published June 21, 1972 (37 F.R. 12237), to Motor Vehicle Safety Standard No. 205, "Glazing Materials" (49 CFR § 571.205). Petitions were received from the Recreational Vehicle Institute (RVI) and the California Highway Patrol. To the extent that this notice does not grant the requests of the petitioners, they are hereby denied.

In the amendment of June 21, the NHTSA changed the application section of the standard, based on FHWA Ruling 68–1 (33 F.R. 5020, March 26, 1968) to expressly include glazing for use in all campers, and defined campers to include both slide-in or "pickup" campers (including a related item, pickup covers) and chassis-mount campers (campers mounted directly onto truck chassis). The 1968 ruling held that Standard No. 205 applied to glazing for use in slide-in campers, and that glazing for use in chassis-mount campers came within the standard when the camper was ultimately attached to a chassis, as the standard applied expressly to the glazing of the completed vehicle, a multipurpose passenger vehicle. The petitioner objects to this amendment on the basis that the recreational vehicle industry has distinguished between the two camper types, and has considered the latter a motor home (a multipurpose passenger vehicle under Standard No. 205), and the former an item of motor vehicle equipment. It requests in its petition that this earlier distinction be retained in the standard.

The NHTSA has determined that the petition of RVI in this regard should be granted, and the applicability section of the standard is amended to refer specifically both to glazing for use in "slide-in campers", as that term is defined in Motor Vehicle Safety Standard No. 126, Truck-Camper Loading, (49 CFR 571.126), and to glazing for use in pickup covers. Chassis-mount campers are included in a newly defined category of multipurpose passenger vehicle, "motor home", and glazing for use in them is subject to the standard insofar as they are incorporated into completed vehicles.

The RVI petition also requested that the requirements of the standard for glazing for use in multipurpose passenger vehicles (including chassis-mount campers and other motor homes) be clarified, suggesting that the requirements be made identical to those for passenger car glazing, with an exception in the case of motor homes for locations other than windshields, and windows directly to the right and left of the driver. It further requested that forward-facing windows of motor homes be considered to be "openings in the roof" under ANS Z.26. The NHTSA has previously, as a matter of interpretation, taken the position that is embodied in this amendment, that for the purposes of Standard No. 205 glazing for use in multipurpose passenger vehicles is subject to the requirements for glazing for use in trucks. This is based on the definition of multipurpose passenger vehicle in section 571.3: "A motor vehicle with motive power, except a trailer, designed to carry 10 persons or less, which is constructed either on a truck chassis or with special features for occasional off-road operation". The agency has decided to adhere to this position.

An exception is hereby adopted for motor home windows other than windshields, forward-facing windows, and windows directly to the right and left of the driver. Manufacturers may use in these other locations any type of glazing allowed by the standard to be used in motor vehicles. This is the position previously adopted for slide-in campers, which have a purpose and use similar to motor homes. The effect of this provision is to allow the use in motor homes, except for windshields, forward-facing windows, and windows to the immediate right and left of the driver, of any item authorized for use in motor vehicles by Standard No. 205. Windshields and windows to the immediate right and left of the driver must conform to the requirements applicable to trucks for those locations. Forward-facing windows may be manufactured of any item authorized for use by the Standard except item 6 (AS 6), item 7 (AS 7), and item 13 (AS 13) flexible plastics.

The California Highway Patrol has petitioned for reconsideration of that part of the amendment which seemed to delete a requirement that persons who cut glazing material must place on the cut material the prime manufacturer's marking. Section 6 of ANS Z26 requires sections of glazing cut from pieces bearing the markings required by that section to be identically marked. The June 21 notice did not delete this provision. It deleted that part of the proposed requirements specifying that persons who cut glazing materials include the DOT symbol and the prime manufacturer's code number. The language of the preamble (p. 12238, col. 3) was intended to reflect only that fact. This amendment clarifies those requirements to make it clear that persons who cut glazing must include the markings required by section 6 of ANS Z26 on each cut piece. The amendment also provides that the prime manufacturer's DOT symbol and code number are to be affixed only to glazing items made by the prime manufacturer as components for specific vehicles, and not on sheets to be cut into components by other persons.

The marking provisions are further amended to specify that the new items of glazing material authorized by the amendment of June 21 be identified for purposes of marking by the marks "AS 12" and "AS 13". The use of these marks does not indicate approval by the American National Standards Institute, but is specified for the purpose of consistency with existing marking requirements.

In light of the above, Motor Vehicle Safety Standard No. 205, Glazing Materials, appearing at 49 CFR § 571.205, is amended . . . .

Effective date: The effective date of April 1, 1973, is retained.

This notice is issued under the authority of Section 103, 114, and 119 of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. 1392, 1403, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on November 8, 1972.

Douglas W. Toms
Administrator

37 F.R. 24035
November 11, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 71–1; Notice 06)

This notice amends Safety Standard No. 205, *Glazing Materials*, to permit the use of rigid plastic glazing in all doors and windows of buses, other than in windshields or in windows to the immediate right or left of the driver.

Effective Date: December 5, 1977.

For Further Information Contact:

Hugh Oates
National Highway Traffic Administration
Washington, D.C. 20590
(202–426–9511)

Supplementary Information: This amendment of Safety Standards No. 205 (49 CFR 571.205) is based on a proposal issued December 30, 1976 (41 FR 56837), in response to a petition for rulemaking from General Motors Corporation. Standard No. 205 currently permits plastic glazing materials to be used in buses only in standee windows and in readily removable windows of buses having a GVWR of more than 10,000 pounds. This amendment expands the permissible locations for plastic glazing in buses of all sizes to include all doors and windows, other than windshields or windows to the immediate right or left of the driver.

As noted in the preamble to the proposal, use of plastics in bus side windows should reduce the safety hazards and maintenance costs resulting from the deliberate breakage of bus windows, since plastic glazing is more difficult to break than regular glass. Further, Safety Standard No. 217, *Bus Window Retention and Release*, (49 CFR 571.217) now provides for emergency occupant egress in buses. One of the reasons for the original prohibition against plastic glazing was the fact it would be difficult to break in emegency situations. Since the issuance of Standard No. 217, the prohibition is no longer necessary.

Comments to the proposal preceding this amendment were submitted by Ford Motor Company, the Flxible Company, and the Department of California Highway Patrol. All three commenters supported the proposed changes. California noted the experimental use of plastic glazing in side windows of buses by the Southern California Rapid Transit District. That experiment showed that plastic glazing is superior to glass with regard to resistance to breakage. Further, California noted that the abrasion-resistance coating on the plastic glazing used in the experiment was sufficient to reduce scratching by wash-rack brushes to an acceptable level, during normal cleaning of the buses.

The proposal specified the use of plastic glazing in all doors and windows, other than windshields and windows to the immediate right or left of the driver, of buses having a GVWR of more than 10,000 pounds. Ford Motor Company recommended that the proposed changes be made applicable to all buses, regardless of gross vehicle weight rating. The NHTSA has determined that Ford's comment has merit since small buses are also now provided with means of emergency egress (Standard No. 217) and since multipurpose passenger vehicles and trucks are currently permitted to have plastic glazing in windows to the rear of the driver. The basic distinction between a small bus under 10,000 pounds GVWR and a van multipurpose passenger vehicle or van truck is the number of designated seating positions. Thus, the safety considerations for these vehicles are generally the same. The proposal is, therefore, made final in a form that includes all buses.

The Flxible Company supported the proposed changes and also recommended that the standard be amended to permit the use of Item 4 and Item 5 plastic glazing in front of "destination and route numbering signs" on buses and in front of interior displays such as route maps or advertisements. Since these changes were not proposed, the NHTSA will consider them in future rulemaking actions.

This amendment should have only a minimal economic and environmental impact, since it relieves a restriction and since the increased use of plastics that may result will have a negligible effect upon the environment.

(Because this amendment relieves a restriction and does not create additional obligations for any person, it is found that an immediate effective date is in the public interest.)

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 205, *Glazing Materials* (49 CFR 571.205), is amended as follows . . .

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.50.)

Issued on November 28, 1977.

Joan Claybrook
Administrator

42 F.R. 61465
December 5, 1977

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

(Docket No. 71-1; Notice No. 8)

ACTION: Final rule (interpretive amendment).

SUMMARY: In response to a petition for rulemaking, this notice amends Safety Standard No. 205, Glazing Materials, to clarify that Item 5 rigid plastics can be used in all the vehicle locations that are specified in the standard for Item 12 rigid plastics, and that Item 7 flexible plastics can be used in all the vehicle locations that are specified in the standard for Item 13 flexible plastics. Glazing materials that comply with Item 5 and Item 7 test requirements, by definition, also comply with the less stringent Item 12 and 13 test requirements, respectively. Currently, however, the standard inadvertently prohibits the use of Items 5 and 7 glazing materials in some of the locations in which the Items 12 and 13 materials may be used. The purpose of this amendment is to modify the standard to remove that inconsistency.

DATES: Effective date (upon publication), July 14, 1980.

ADDRESSES: Any petition for reconsideration should refer to the docket number and notice number specified in this notice and be submitted to Docket Section, Room 5108, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590.

FOR FURTHER INFORMATION CONTACT:

Mr. Edward Jettner, Office of Vehicle Safety
Standards, National Highway Traffic Safety
Administration, 400 Seventh Street, S.W.,
Washington, D.C. 20590 (202-426-2264)

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, Glazing Materials (49 CFR 571.205), specifies performance requirements for vehicle glazing as well as the locations in which particular types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1—1966 (hereinafter ANS Z26). The ANS Z26 standard defines the various types of glazing in terms of performance tests with which a particular "Item" must comply. There are currently 13 Items or types of glazing specified in the standard.

Safety Standard No. 205 was amended in 1972 to allow two additional types of glazing for use in specified vehicle locations not required for driving visibility (37 FR 12237, June 21, 1972). The first new glazing type was rigid plastic described as "Item 12", and the second was flexible plastic described as "Item 13". The test requirements specified for Item 12 are identical to the test requirements for Item 5 rigid plastics, and the test requirements for Item 13 are identical to the test requirements for Item 7 flexible plastics, except that neither Item 12 nor 13 is required to meet the test for resistance to undiluted denatured alcohol (Formula SD No. 30). Therefore, the performance requirements of the standard are more stringent for Items 5 and 7 than for Items 12 and 13, respectively, because of the one additional test with which the former must comply.

When Items 12 and 13 were added to the standard, several locations in which the types could be used were specified which were not included for Items 5 and 7. Thus, the standard specifies that Item 12 plastics may be used as motorcycle windscreens, but there is no such specification for Item 5 plastics. Similarly, the standard allows Item 13 plastics to be used in standee windows in buses, interior partitions, and in openings in the roof, but does not specify these locations for Item 7 plastics.

Since Item 5 and 7 glazing materials must meet more stringent requirements, they should be allowed in all vehicle locations in which Items 12 and 13 may be used. Last year, the Rohm and Haas Company petitioned the agency to amend Safety Standard No. 205 to remove this inconsistency. This notice responds to that petition.

The agency agrees that the standard is currently inconsistent with regard to the locations in which the various types of rigid and flexible plastics may be used. When Items 12 and 13 were added to the standard, the agency inadvertently failed to expand the list of permitted locations for Items 5 and 7 so that the list would include all of the locations specified for Items 12 and 13. (The agency wishes to point out that there are several locations specified for Items 5 and 7 in which Items 12 and 13 may not be used. This is appropriate since the performance requirements for Items 5 and 7 are more stringent.)

The agency has determined that the change requested by the petitioner can be accomplished by interpretive amendment and that opportunity for public comment is not required. Items 5 and 7 glazing also qualify as Items 12 and 13, respectively, because an item of glazing is only defined in the standard in terms of the test requirements it can meet. Since Items 5 and 7 glazing comply with all the test requirements specified for Items 12 and 13, manufacturers would be permitted to mark a particular piece of glazing as Item 12 or 13 and to use the glazing in the locations specified for those Items, even though that piece of glazing could also pass the additional test requirement for the higher-grade plastics, Items 5 or 7. There is nothing in the standard which requires a specific piece of glazing to be labeled with the highest performance Item number with which it can qualify, although for practical purposes this is generally done. In other words, Items 12 and 13 glazing are lower performance forms of Items 5 and 7 glazing. Therefore, Items 5 and 7 can be used wherever Items 12 and 13 may be used in the vehicle. This notice amends Standard No. 205 to clarify this point by making the necessary additions to the list of locations currently specified for Items 5 and 7.

Since this amendment removes a current inconsistency in the standard, the agency has determined that an immediate effective date is in the public interest.

The agency has determined that this amendment does not qualify as a significant regulation under Executive Order 12044 and the Departmental directives implementing that Order. Since the amendment only clarifies existing requirements, there should be negligible cost or environmental impacts resulting from this modification. Therefore, no regulatory evaluation has been prepared.

The engineer and lawyer primarily responsible for the development of this amendment are Edward Jettner and Hugh Oates, respectively.

In consideration of the foregoing, Safety Standard No. 205, 49 CFR 571.205, is amended as set forth below.

1. Paragraph S5.1.1.2 is amended by adding a new subparagraph "(m)" to read:

"(m) for Item 5 safety glazing only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position."

2. Paragraph S5.1.1.3 is amended by adding the following phrase and new subparagraphs "(l), (m) and (n)" after existing subparagraph (k), to read:

"For Item 7 safety glazing only:

(l) Standee windows in buses.

(m) Interior partitions.

(n) Openings in the roof."

Issued on July 1, 1980.

Joan Claybrook
Administrator

45 FR 47150
July 14, 1980

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Federal Motor Vehicle Safety Standards, Glazing Materials and Rearview Mirrors

(Docket No. 71-1; Notice 8,
Docket No. 79-19; Notice 2)

ACTION: Final rule.

SUMMARY: This notice amends Safety Standard No. 205, *Glazing Materials*, to delete the abrasion resistance requirements specified for Items 3, 5, 9, and 12 glazing. The purpose of the abrasion requirements is to ensure that glazing will resist scratching that can distort the driver's view and thus reduce visibility. The glazing Items specified above, however, can be used in vehicles only in window locations that are not necessary for driving visibility. These locations include sun roofs and side windows to the rear of the driver in trucks, multipurpose passenger vehicles (MPV's), and buses. Since the standard currently does not require glazing in window locations such as these to be transparent, there is no real need for Items 3, 5, 9, and 12 to pass the abrasion tests. Thus, this notice deletes the abrasion requirements for these types of glazing.

The agency has decided, however, not to adopt another proposed amendment to Standard No. 205, or a related change in Standard No. 111, *Rearview Mirrors.* These amendments would have made the rear-most windows of trucks, MPV's, and buses having GVWR's of 10,000 pounds or less requisite for driving visibility. The proposal would have also required the manufacturers of such vehicles to install inside rearview mirrors.

DATES: The amendment is effective on August 31, 1981.

ADDRESSES: Petitions for reconsideration should refer to the docket and notice numbers and be submitted to: Docket Section, Room 5109, National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590. (Docket hours: 7:45 a.m. to 4:15 p.m.)

SUPPLEMENTARY INFORMATION: On September 27, 1979, NHTSA published a notice of proposed rulemaking (44 F.R. 55610) regarding Standard No. 205, *Glazing Materials* (49 CFR 571.205). That notice proposed to amend the standard to delete the abrasion requirements for Items 3, 5, 9, and 12 glazing. The notice also proposed to amend the standard to clarify that the rear windows of trucks, multipurpose passenger vehicles (MPV's), and buses having gross vehicle weight ratings (GVWR's) of 10,000 pounds or less are considered requisite for driving visibility. This would have required that glazing materials used in the rear windows of these vehicles have a luminous transmittance of at least 70 percent. On December 31, 1979, in a related action, the agency published a notice of proposed rulemaking (44 F.R. 77224) regarding Standard No. 111, *Rearview Mirrors.* That proposal would have amended Standard No. 111 to require that light trucks and vans having rear windows be equipped with an inside rearview mirror. The purpose of the two proposals was to improve rearward visibility for the drivers of those vehicles.

Consumers, vehicle manufacturers, trade associations, equipment manufacturers, and others submitted comments in response to the notices. The final rule is based on a thorough evaluation of the data obtained in NHTSA research, data and views submitted in the comments and data obtained from other pertinent documents and reports. The major comments are discussed below, along with the agency's final decision on each proposal.

The Abrasion Requirements

Standard No. 205 specifies performance requirements for glazing materials to be used in motor vehicles and motor vehicle equipment, and also specifies the vehicle locations in which various types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1-1966 (ANS Z26). The abrasion resistance requirements of Standard No. 205 are set forth in ANS Z26 in terms of performance tests that the various "Items" of glazing must pass. (There are 13 "Items" or types of glazing for which requirements are specified in the standard.) Items 3 and 9 glass glazing materials are required to pass Abrasion Test No. 18, which allows no more than two (2) percent light scatter or haze when the glazing is abraded for 1,000 cycles. Items 5 and 12, which are rigid plastic glazing materials, must pass Abrasion Test No. 17 (less than 15 percent light scatter or haze when abraded for 100 cycles). The purpose of the abrasion tests is to assure that glazing resists scratching which can distort the driver's view and thus reduce visibility. Visibility through the Items of glazing in question, however, is not required, as the glazing can only be used in locations not necessary for driving visibility. Since the abrasion requirements test for a quality that is not relevant to Items 3, 5, 9, and 12 glazing, NHTSA proposed that they be deleted for these types of glazing material.

Several comments were submitted on this proposal, and virtually all were in favor of its adoption. Chrysler and Ford noted that the abrasion tests are not relevant to Items 3, 5, 9 and 12 glazing since such Items cannot be used in locations requisite for driving visibility. GM stated that deletion of these tests for the Items in question would resolve some of the inconsistencies in the standard. One such inconsistency noted by GM is the fact that the current standard allows rigid plastics, which are required to pass a less stringent abrasion test than glass glazing materials, to be used in locations in which glass in combination with treated coatings would not be allowed. Rohm and Haas Company noted in their comments, however, that this proposal may permit materials to be used which will not be as durable and functional as currently used materials and thus will present a poor appearance.

The agency has decided to adopt the proposed amendment. As emphasized by Ford and Chrysler in their comments, there is no compelling safety need for retaining the abrasion requirements for these four glazing Items since the standard prohibits their use in vehicle locations that are requisite for driving visibility. The abrasion requirements for these Items do serve as additional tests of glazing strength and durability. However, there are other more direct tests of these characteristics (such as the Impact Tests Nos. 8-14 of ANS Z26) that are applicable to these Items and that will ensure that the glazing remains in safe condition throughout its useful life. Considering that totally opaque glazing is permitted by the standard, there is no justification for imposing the abrasion requirements on these Items. Deletion of the abrasion requirements should result in cost savings for some vehicles, because less expensive types of glazing would qualify for installation. Manufacturers would be able to use plastic glazing that is more resilient and thus may reduce the possibility of occupant ejection in a crash. In light of these considerations, the agency has decided to delete the abrasion tests for Items 3, 5, 9, and 12 glazing.

Rear Window Visibility

The September 27, 1979 notice also proposed to amend Standard No. 205 to clarify that the rear-most windows (if present) in trucks, MPV's and buses having GVWR's of 10,000 pounds or less are requisite for driving visibility. This would have required that glazing materials used in the rear windows of these vehicles have a luminous transmittance of at least 70 percent, as specified in Test No. 2 of ANS Z26. At present, Standard No. 205 allows the use of certain types of glazing (Items 3, 9, and 12) that are not required to have a luminous transmittance of 70 percent if the rear window is not requisite for driving visibility. Item 5 glazing may also be used if the rear window is not requisite for driving visibility and other means of visibility to the side and rear of the vehicle are provided. The standard does not specify, however, which rear windows are necessary for driving visibility. The proposed change would have resolved the indefiniteness of the present standard in regard to which rear windows of trucks, MPV's, and buses are considered necessary for driving visibility.

All the comments filed regarding the proposed amendment disapproved of the change. Many commenters stated that the agency had presented no evidence showing that a safety problem exists because the rear windows of trucks and buses are not required to be transparent. The commenters suggested that if a vehicle is equipped with an outside mirror system as proposed in Docket No. 71-3a, Notice 4, *Rearview Mirror Systems*, and meets the proposed requirements of Docket 70-7, Notice 05, *Fields of Direct View*, the needs of drivers for visibility, both direct and indirect, will be satisfied. The proposed amendment to Standard No. 205 would then be redundant. Thus many of the commenters argued that the proposed change should not be adopted, or else should be incorporated as part of Standard No. 111, *Rearview Mirrors*, and made applicable only when the manufacturer is using inside mirrors to satisfy the other requirements of the standard. (On June 22, 1981, NHTSA published a notice in the *Federal Register* that rescinded Standard No. 128, *Fields of Direct View* (46 F.R. 32254). That decision has no effect on this rulemaking proceeding.) Almost all the commenters felt that the purpose of the amendment—to increase visibility to the rear of certain vehicles and thereby improve safety—would be easily circumvented. Either cargo or passengers would block the driver's view of the rear window, or the owner of the vehicle would hang curtains or reflective film to ensure privacy. Many of the commenters noted that there is no requirement that trucks and vans even have a rear window. Several pointed out that the proposed amendment will waste fuel, because the 70 percent luminous transmittance requirement will eliminate the use of plastic glazing (which is lighter in weight than glass) and will increase the use of air conditioners since smoked glass windows will be prohibited.

The NHTSA has decided not to adopt this proposed amendment to Standard No. 205. The agency believes that consumers would not derive a significant safety benefit from such a regulation. However, NHTSA encourages vehicle manufacturers to voluntarily use glazing which has a luminous transmittance of at least 70 percent in the rear windows of trucks, MPV's, and buses.

Inside Rearview Mirrors

Standard No. 111, *Rearview Mirrors*, currently allows the manufacturers of MPV's, trucks and buses (other than school buses) that have GVWR's of 10,000 pounds or less the option of complying with either of two rearward visibility requirements. A manufacturer may equip those vehicles with inside and outside rearview mirrors which meet the requirements for passenger car mirrors. Or, it may equip the vehicle with larger outside mirrors on each side of the vehicle and forego providing any inside mirror. Under the latter alternative, the outside mirrors must be plane mirrors and have not less than 19.5 square inches of reflective surface.

Notice 1 of Docket 79-19 proposed an amendment to Standard No. 111. That proposal would have required manufacturers of light trucks, MPV's, and buses (other than school buses) equipped with rear windows to install in those vehicles an inside rearview mirror that is similar to mirrors found in passenger cars. Manufacturers would have had the same options for compliance as before, except that if a manufacturer chose to provide only the larger outside mirrors, he would also have to install an inside mirror that provided a field of view through the full horizontal width of the rear window. (The inside rearview mirror in a passenger car must provide a field of view through a 20 degree horizontal angle and through a vertical angle sufficiently large to provide a view of a level road surface extending to the horizon beginning at a point not greater than 200 feet to the rear of the vehicle.) The proposed amendment supplemented the proposed changes in Standard No. 205 regarding rear window visibility. The proposed amendment to Standard No. 111 would have enabled drivers to take full advantage of the more transparent glazing materials that would have been required in rear windows.

The manufacturers and trade associations who submitted comments on the proposed amendment were unanimous in their opposition to it. Many emphasized that the research cited in support of Docket No. 71-3a, Notice 4, *Rearview Mirror Systems*, which proposes to upgrade Standard No. 111, does not indicate a need for inside rearview mirrors when outside mirrors are adequate. The inside rearview mirror would be totally useless if the rear window of the vehicle is blocked by cargo, passengers, or the like. Most of the commenters noted that a pick-up truck manufacturer who complies with the large outside mirrors/inside mirror option (as opposed to the passenger car mirrors requirement) would have to install an extremely wide inside mirror. This would be necessary if the mirror was to provide a field of view through the full horizontal width of the rear window because of the close proximity of the mirror to the backlite. According to the commenters, such a wide mirror would interfere with the driver's ability to see through the windshield and could not be mounted in a stable, vibration-free manner. Some commenters noted that most of the affected vehicles already have inside rearview mirrors, despite the fact that most rear windows are designed only to admit ambient light, not for visibility. One second-stage manufacturer stated that NHTSA had underestimated the cost of the amendment to the ultimate consumer.

The NHTSA has decided not to adopt the proposed amendment to Standard No. 111. Since the agency has decided not to make the rear windows of trucks and vans requisite for driving visibility, there is no need to require such vehicles to have an inside rearview mirror which would enable drivers to take advantage of the improved visibility the glazing would have provided. Also, the agency has observed that virtually all vehicle manufacturers voluntarily provide inside rearview mirrors as standard equipment on their light trucks and vans. The agency approves of this practice and encourages manufacturers to continue it. NHTSA will continue to study the question of whether inside rearview mirrors should be mandated for trucks, buses and MPV's as a part of Docket No. 71-3a, Notice 4, *Rearview Mirror Systems.*

Costs

The NHTSA has considered the economic impacts of the amendment to Standard No. 205 that will delete the abrasion requirements for Items 3, 5, 9, and 12 glazing. The agency has determined that this rule is not a major rule within the meaning of Executive Order 12291 or a significant rule under the Department of Transportation's policies and procedures for implementing that order. Based on that assessment, NHTSA has further concluded that the economic and other consequences of the amendment are so minimal that a regulatory evaluation is not necessary. Deletion of this requirement will permit the use of less expensive types of glazing in motor vehicles. Thus, NHTSA anticipates cost savings for some vehicles as a result of this amendment. However, the agency expects that the cost savings will not be significant.

NHTSA has also evaluated the environmental impact of this amendment in accordance with the National Environmental Policy Act (42 U.S.C. § 4321 *et seq.*) and has determined that the amendment will not have a significant effect on the environment. Reasons for this finding can be found in the Environmental Assessment, copies of which will be placed in the public docket.

Issued on August 24, 1981.

Raymond A. Peck, Jr.
Administrator
46 F.R. 43687
August 31, 1981

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

[Docket No. 81-04; Notice 4]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Safety Standard No. 205, *Glazing Materials*, to permit the installation of glass-plastic glazing a windshield and windows in motor vehicles and to establish appropriate performance requirements for such glazing. The existing requirements of the standard do not permit the use of glass-plastic glazing in areas necessary for driving visibility because the currently produced materials cannot meet the abrasion resistance requirements of the standard.

The agency has determined that glass-plastic glazing should be allowed because research data and limited field experience indicate that such glazing substantially reduces lacerative injuries when vehicle occupants strike windows and windshields in an accident. Although there are still certain concerns about potential problems with this type of glazing material, the agency believes these to be minor, and has concluded that the safety benefits derived from this material outweigh the possible problems. This amendment permits, but does not require, the use of glass-plastic glazing.

EFFECTIVE DATE: November 16, 1983.

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, *Glazing Materials*, (49 CFR 571.205) specifies performance requirements for the types of glazing that may be used in motor vehicles, as well as the vehicle locations in which the various types of glazing may be used. The standard incorporates by reference the American National Standard "Safety Code for Glazing Materials for Glazing Motor Vehicles Operating on Land Highways," Z26.1—1966 (ANS Z26). The requirements in ANS Z26 are specified in terms of performance tests that the various types or "Items" of glazing must pass. There are 13 "Items" of glazing for which requirements are currently specified in the standard. Currently, the only types of glazing that may be used in the windshield of motor vehicles are Item 1, Safety Glazing Material for Use Anywhere in a Motor Vehicle, and Item 10, Bullet Resistant Glass.

The windshield in all current vehicles is a "High Penetration Resistant" (HPR) windshield whose interior and exterior surfaces are made of glass, held together by an intervening layer or layers of plastic. When HPR windshields are impacted in an accident, both the inner and outer glass layers tend to break, leaving edges of broken glass on the inner surface (i.e., the side of the windshield facing the interior of the vehicle).

To alleviate the problem of lacerative injuries which result from this broken glass, manufacturers have experimented with windshields composed of laminated glass to which a layer of soft plastic is bonded on the inner side. Saint Gobain Vitrage of France has developed one such windshield called Securiflex, which has a layer of polyurethane on the inner surface. The Securiflex windshield has been demonstrated to reduce the risk of lacerations to car occupants who strike the window in an accident because the plastic inner layer prevents the occupant from coming into contact with the sharp glass edges that are formed when the glass is broken.

Although Securiflex has the potential for reducing many serious lacerative injuries, it cannot pass current Test No. 18, *Abrasion Resistance*, of Standard No. 205 when tested on the inner plastic side. The existing abrasion requirements were established in ANS Z26 prior to the development of glass-plastic glazing materials, such as Securiflex, and were geared specifically to symmetrical glass glazing. Since Securiflex cannot pass the current abrasion requirements, it may not be installed in motor vehicles manufactured in or imported into the U.S. at the present time.

In light of this fact, Saint Gobain petitioned the agency June 1980 to amend Standard No. 205 to permit the use of glass-plastic glazing, such as Securiflex, by establishing performance requirements that are appropriate for the special use characteristics of this new technology (i.e., the plastic inner layer of this material is not exposed to the harsher environment outside the vehicle).

In response to this petition, the agency issued an advance notice of proposed rulemaking on January 26, 1981, concerning possible performance requirements for glass-plastic glazing (46 FR 8067). Following further study and a review of the information received in response to the advance notice, on March 10, 1983, the agency issued a notice of proposed rulemaking to amend Standard No. 205 to permit the installation of glass-plastic glazing materials (48 FR 10097). The proposal specified performance requirements designed particularly for glass-plastic glazing, recognizing the varying environmental demands placed on the outer and the inner surfaces of this material. (For a complete understanding of the technical issues involved in this rulemaking, as well as a description of the specific performance requirements proposed, interested persons should consult both the advance notice and the notice of proposed rulemaking referred to earlier.)

As noted in the notice of proposed rulemaking, one of the primary issues in this rulemaking is whether the inner plastic side of glass-plastic glazing can adequately resist abrasion. Plastic does not resist the surface damage caused by rubbing and scraping as well as glass. Abrasion is a potential concern since it produces haze which scatters the light passing through the glazing in a way that can make it more difficult for the driver to see through the windows. Other issues which were discussed in the proposal included: the possible problem of delamination of glass-plastic glazing; rearview mirror attachment to the plastic surface of glass-plastic glazing; attachment and removal of decals in relation to the plastic side of glass-plastic glazing; and the effect of glass-plastic glazing on head impact forces (HIC values).

A majority of comments received in response to the proposal supported permissible use of glass-plastic glazing in all vehicle locations. These supporting comments unanimously cited the great potential of glass-plastic glazing for reducing lacerative injuries in vehicle accidents, and stated that solutions can be found for the potential technical problems associated with this material. Several commenters, however, voiced serious concern about the level of stringency of the requirements (i.e., not high enough), outstanding technical issues, and quality control problems. These commenters urged further research and field testing prior to amending the standard to permit the use of glass-plastic glazing. Following is a discussion of the points raised in these comments, along with a discussion of the agency's analysis and conclusions.

Haze and Transmittance

From the outset of this rulemaking, one of the major concerns about glass-plastic glazing has been the ability of the inner plastic liner to resist abrasion which could lead to haze and loss of light transmittance, thereby reducing driving visibility. The proposal specified that glass-plastic glazing materials to be used in areas requisite for driving visibility must meet Abrasion Test No. 17, allowing a haze of only 4 percent after 100 cycles of controlled laboratory abrasion.

Several commenters pointed out that there is still no clear relationship between haze and driver visibility (i.e., when haze becomes a safety factor), and stated that the levels specified in the proposal were only arbitrary levels. DuPont questioned what it calls a relaxation of the standard's requirements (HPR windshields must meet a 2 percent haze maximum after 1,000 cycles of the Taber abraser).

The agency believes that different test procedures and performance requirements set for glass-plastic glazing are appropriate given the differences in actual exposure between the inner plastic liner and the glass side of the windshield. The inner plastic liner will not experience the same exposure to outdoor environmental conditions that the glass side of this glazing will encounter. Therefore, the abrasion requirements for the two sides are not equivalent and the 2 percent limitation specified for the glass cannot be compared to the specification for the plastic inner liner (i.e., the latter should not be considered a "relaxation").

The specified abrasion requirement for the plastic side of glass-plastic glazing was tailored to the requirement for this type glazing specified by the

Economic Commission for Europe (ECE) in ECE Regulation 43, which is currently recognized in some form by 20 European countries. The agency has also obtained data describing haze build up on Securiflex windshields in use in Europe (Docket No. 81-04-N01, Entry 03A) as well as data that describe haze buildup and loss of transmittance of standard HPR windshields in the United States (Docket No. 81-4-N01, Entry 048). These data indicate that Securiflex windshields tested to ECE Regulation 43 are, in actual use, no less durable than ordinary windshields. In light of the test data currently available, the agency believes that the 4 percent test limitation specified in the proposal for the plastic liner of glass-plastic glazing is sufficient to minimize the loss of transmittance and to provide adequate driving visibility. However, the agency does solicit any information or data that any party may obtain in the future concerning the relationship between haze buildup and driving visibility. The agency also intends to monitor closely this aspect of glass-plastic glazing performance as this product is introduced in the market. If future information indicates that changes in the abrasion requirements are necessary, the agency will, of course, take appropriate action.

Discoloration

The plastic side of glass-plastic glazing is susceptible to chemical alteration (becoming yellow or cloudy) when exposed to intense and prolonged ultraviolet radiation. Chrysler Corporation cited tests it conducted in the Arizona desert in which a glass-plastic windshield was exposed to direct sunlight for 2 years. Chrysler stated that the test results showed that the plastic surface became etched, hazy, and translucent after 1 year of exposure. That company argued that the proposed requirements will not insure that glass-plastic material performs satisfactorily throughout the wide range of environmental and usage conditions it will encounter in the United States. PPG Industries also stated that the test procedure included in the proposal for weathering is insufficient because the ultraviolet radiation in the test is only directed against the glass side of glass-plastic glazing.

The agency believes that the Chrysler test involved a much more severe exposure to the sun than glass-plastic windshields would experience in actual use, because the plastic side of the windshield would be inside the vehicle and receive little direct ultraviolet exposure in most cars. The amount of ultraviolet light that will actually pass through the windshield to the inside layer of plastic should be minimal, since test data provided by DuPont indicate that the plastic inner layer in HPR windshields acts as an effective filter for ultraviolet light.

The agency also believes that the proposed weathering test procedures (i.e., direct ultraviolet exposure of the exterior surface of the windshield and not the interior plastic surface) of Test No. 16 is the best simulation of the exposure the windshield will receive when it is installed in a car. Thus, the agency has decided not to adopt PPG's recommendation for changing the test procedure.

The agency is, however, concerned about the potential exposure of the plastic side of the windshield in convertibles and vehicles that have no or removable tops. While the agency believes that a prolonged test directing ultraviolet radiation against the plastic side of the glazing would be overly stringent, it does believe that it may be appropriate to set some requirement for directing ultraviolet radiation against the plastic side of glass-plastic glazing for use in convertibles or cars with no or removable tops. At this time, the agency lacks the necessary data to support such a requirement. As an interim solution, the agency has decided to prohibit the use of glass-plastic glazing in those vehicles until such data are available. This prohibition does not apply to the use of glass-plastic glazing in vehicles with sun roof or T-tops. The probability that the plastic side of the glazing in those vehicles would be directly exposed to the sun over a prolonged period is particularly small due to the installation angle of the windshield and restricted path of the sunlight through the opening in the top of the vehicle.

Commenters also raised questions about the susceptibility of glass-plastic glazing to deterioration resulting from exposure to some chemicals. Since glass-plastic glazing would be exposed to various cleaning agents, the proposal included Test No. 19, *Chemical Resistance*, to insure that inferior plastic materials are not used in glass-plastic glazing. Libby-Owens-Ford said that in its tests, glass-plastic materials were damaged when exposed to one commercial glass cleaner. Information provided by the Maryland State Police, however, indicates that they have used commercial glass cleaners on their glass-plastic windshields without problems. Because of potential problems that may be associated with some commercial glass cleaners, the agency has added an additional generic formula, typical of several chemical glass cleaners, including the one used in the Libby-Owens-Ford test, to the list specified in the chemical resistance test to simulate the use of commercial glass cleaners.

Frost Removal

There has been some concern that the plastic side of glass-plastic glazing could become overly abraded by the scraping action of vehicle owners in the removal of frost. Transport Canada recently conducted a study of this problem and determined that the plastic surface of the glass-plastic samples tested did not develop haze levels in excess of 2 percent when subjected to frost removal scrapings. (See Docket No. 81-04-NO3, Entry 13.) The tests did show that the plastic samples did receive fine scratches from the scraping and several commenters argued that this indicates that there is still a serious problem. The agency disagrees and believes that the low haze level is within acceptable limits. If owners remove frost with plastic scrapers, the agency does not expect there to be any noticeable degradation of visibility through this glazing. Since the cleaning instruction label will instruct owners on the proper method of frost removal, there should be no problem.

Decal Removal

There has also been concern that the plastic surface of the subject glazing could be cut or abraded during the process of removing decals from the windshield (e.g., removing of State inspection stickers). The proposal discussed this problem and noted that, as one possible solution, special decals could be produced which could be peeled off easily without the use of damaging tools. Several vehicle manufacturers mentioned this problem and discussed other possible solutions. General Motors suggested that a "free corner" could be provided on the lower surface of the windshield to allow a small area of exposed glass (i.e., no plastic) which would serve as a decal mounting zone. Ford said that it had experimented with a plastic mounting which would be placed over the plastic inner liner of glass-plastic windshields on which the decals could be attached.

The agency believes that all of these suggestions are possible solutions to this potential problem, and that manufacturers should be allowed to experiment with various methods. Consequently, no specific requirements regarding decal placement are included in this rule. The agency does not believe that the potential problem is insurmountable or so great that it should preclude the use of glass-plastic glazing. Since decals are ordinarily placed where they don't obstruct the driver's view of the road ahead, any damage that does result from decal removal would also not block that view.

Mirror Attachment

The notice of proposed rulemaking discussed the potential difficulty of attaching rearview mirrors to the plastic side of glass-plastic windshields, because of problems of adherence. As noted in the proposal, a review of technical material presented in SAE Paper 770246 (Docket No. 81-04-NO1, Entry 009) indicates that this is not an insurmountable technical problem. The agency also noted that Saint Gobain is recommending an acrylic adhesive material for mirror attachment.

General Motors currently has a test fleet of 2,500 vehicles equipped with Securiflex windshields which have been in the field for several months. General Motors does report that three mirrors have fallen off in this test fleet and attributes this occurrence to poor adhesion of the mounting button to the plastic (the adhesive used was that recommended by Saint Gobain). General Motors stated that if the adhesion cannot be improved, it may be necessary to provide a hole in the inner plastic liner so that the mirror button can be attached directly to the glass, using current production methods. The agency believes that this is a viable alternative. Also, the mirror could be attached directly to the windshield header rather than to the windshield, as was typically done in all production vehicles ten years ago. Since Standard No. 111, *Rearview Mirrors*, requires all mirrors to have breakaway mountings, there should not be a safety difference in placing the mirrors directly on the windshield or on the windshield header. Although either of these alternative solutions would involve some slight additional costs, the agency believes they offer a technically feasible solution should they become necessary. No commenters suggested that the rule should not go forward because of potential difficulties in this area.

Delamination

To insure that the inner plastic layer of glass-plastic glazing does not separate (delaminate) from the glass layer during use, the notice of proposed rulemaking specified that these materials must pass Test No. 28, *Resistance to Temperature Change*. This procedure involves the testing of 12-inch by 12-inch specimens by exposing them to extremely cold and hot temperatures (−40 to +161° F) to determine whether the plastic will delaminate from the glass. Several commenters stated that this test procedure is inadequate because the small test samples do not simulate the performance of entire windshields. These manufacturers argued that the stress placed on glass-plastic glazing when molded into windshields (i.e., the curvature) can cause delamination in certain glass-plastic material which is not evident when small, flat samples are tested. General Motors also noted that it would not market glass-plastic windshields without conducting the delamination tests on the entire windshields, regardless of the requirements of the standard.

The agency has given careful consideration to these comments. However, the agency believes that this concern is primarily a quality control consideration for the manufacturer of the windshield, since delamination is not directly related to safety, unless there are instantaneous delaminations while a vehicle is being driven. The agency believes that the tests specified in the proposal and included in this final rule are adequate to insure the minimum performance of glass-plastic glazing in terms of delamination resistance. In addition to Test No. 28, this rule includes two other tests that relate directly to delamination. Test No. 3, *Humidity*, investigates the behavior of the laminated construction when exposed to high levels of moisture (100 percent relative humidity). Test No. 4, *Boil Test*, evaluates laminated materials when exposed to tropical temperatures. The agency believes that this combination of tests is adequate to insure that low-quality glass-plastic material will not be produced, even though the tests involve small samples. It should be noted that Test No. 28, *Resistance to Temperature Change*, is not currently specified under the standard for Item 1 HPR windshields. This additional test is specifically added to insure the integrity of glass-plastic material in terms of delamination resistance.

Flammability and Toxicity

The notice of proposed rulemaking included a specific degree of flame resistance, Test No. 24. PPG Industries stated that this test may not be sufficient because it does not measure the possibility of toxicity or dense smoke which can result from the burning of some plastics. The agency has considered this comment but does not believe that will represent a real problem with glass-plastics that comply with Test No. 24. For example, the Maryland State Police (MSP) reported to the agency that there was a fire in one of their vehicles equipped with a Securiflex windshield. MSP said that an examination of the windshield after the fire showed that the inner plastic liner was self-extinguishing. Further, the time required to egress from a burning vehicle is sufficiently short that toxicity should not be pertinent. The agency does intend, however, to monitor glass-plastic windows that may be introduced in the market in terms of this consideration.

General Motors also questioned whether Test No. 24 (specified for thick plastic materials), which was specified in the proposal, should be included rather than Test No. 23 (specified for thin plastic materials). That company also suggested that Safety Standard No. 302, *Flammability of Interior Materials*, may be sufficient to insure adequate flame resistance in glass-plastic glazing.

The agency specified Test No. 24, rather than 23, because the overall construction of glass-plastic glazing is "thick" not "thin". Test No. 24 will evaluate the burning behavior of the plastic inner liner as it is bonded to the windshield glass, and the agency believes that this is a more appropriate test than Test No. 23.

Relying on Safety Standard No. 302 to insure the flame resistance of glass-plastic glazing is not possible since that standard only applies to vehicles and does not cover items of aftermarket equipment. Safety Standard No. 205 is an equipment standard and the inclusion of Test No. 24 will insure that the glass-plastic glazing manufacturer has analyzed the flame resistance of its product.

Head Injury Criterion (HIC)

The notice of proposed rulemaking noted that some data indicate there may be somewhat higher occupant HIC values in crashes with glass-plastic windshields (HIC values are calculated from readings from instrumented dummies involved in barrier crash tests and are a measuring tool used to assess the injury-producing effects of a crash). Data reported by Patrick and Chou (Docket No. 81-04-N01, Entry 009) show graphically that the "best fit" curve of HIC values for glass-plastic glazing is approximately 100 units higher than the comparable curve representing the standard HPR windshield. Libby-Owens-Ford and PPG stated concern about this matter and suggested the need for additional testing. No commenter suggested a specific HIC value requirement that should be included in the standard at the current time.

Ford Motor Company stated that it had analyzed the data used by Patrick and Chou and found no statistically significant differences in anthropomorphic test device HIC response due to differences in windshield type. GM also reported that the only test it had run to date with a glass-plastic windshield produced a HIC considerably lower than an equivalent test of a windshield without the inner plastic liner. In addition, Volkswagen reported that in all of its tests the HIC values with Securiflex windshields were lower than those with conventional windshields.

Currently, the cost of glazing and vehicle production (including fuel economy considerations) favors glazing of the minimum acceptable thickness and weight. This will help to insure that very thick plastic coatings are not used on glass-plastic windshields, which could possibly lead to increased HIC values. The agency is not including any dynamic testing for glass-plastic windshields at the current time, since the available data show that glass-plastic glazing apparently does not adversely affect HIC values. In fact, test data supplied by some commenters show lower HIC values with glass-plastic glazing. The agency will continue to evaluate this aspect of glazing performance, however, as glass-plastic glazing is introduced into the market.

On a related issue, DuPont noted that the proposed definition of glass-plastic glazing would allow glass-plastic laminates containing only one sheet of glass, and states that this radical departure from existing windshield construction could lead to unforeseen safety problems. Existing windshields are laminates of glass-plastic-glass. Securiflex is constructed of a typical windshield laminate with an extra layer of bonded plastic.

The agency does intend to allow glass-plastic constructions of only two layers if manufacturers choose to develop such designs. Such constructions could potentially be very beneficial in terms of reducing lacerations and ejections, while at the same time possibly reducing vehicle weight and cost. The agency is aware that certain manufacturers are already experimenting with two-ply constructions which show much promise. NHTSA does not wish to squelch innovation in this area by restricting the construction of glass-plastic materials, and believes that the specified performance requirements will insure that inferior materials are not produced (e.g., two-ply materials would have to meet the impact resistance test specified in this rule for glass-plastic materials).

Lacerations

Libby-Owens-Ford and PPG expressed concern that no performance requirement was included in the proposal to measure the antilacerative characteristics of glass-plastic glazing. These commenters are concerned that brittle plastics could be used which might actually increase lacerations. The agency does not believe this is a valid concern because there is no reason a manufacturer would choose to use a hard plastic of such thickness that it would be brittle.

Moreover, no reliable laceration test currently exists. The gathering of extensive field experience is absolutely essential before a sound, realistic, and reproducible laceration test can be developed, if it is determined one is even needed. The SAE Glazing Committee established a task force which worked for several years, without success, trying to articulate a laceration test.

The agency believes that the existing data regarding glass-plastic glazing thoroughly establish its great antilacerative potential. Sled-test crash simulations using test dummies having chamois-covered heads clearly indicate that glass-plastic constructions eliminate virtually all lacerations. Further, in spite of the short time period and small number of cars in the current field evaluation projects under way, there are already two real-world crash experiences which dramatically demonstrate the antilacerative properties of glass-plastic windshields. The Maryland State Police have a test fleet of 100 vehicles equipped with Securiflex windshields. One of their patrolmen was involved in a serious accident in which the officer's head struck and broke the windshield, yet no lacerations occurred on his face. General Motors has a rental test fleet of 2,500 vehicles equipped with Securiflex windshields. General Motors has told the agency that it is aware of 11 crashes in which an occupant struck the windshield. General Motors reported that none of the occupants in those cars suffered lacerations caused by the cutting action of broken windshield glass. The agency believes that this experience and the other existing data concerning the antilacerative properties of glass-plastic glazing justify allowing this material at the current time even though no laceration index or test is currently available. (It should be noted that there is also no laceration test for existing HPR windshields; it is known that these windshields cause thousands of lacerative injuries each year.)

Ford Motor Company requested a clarification in the test requirements for glass-plastic glazing to specify that in conducting Test No. 2, Luminous Transmittance, data obtained from Test No. 1, Light Stability, rather than Test No. 16, Weathering, should be used. Ford's point is that in testing glazing, Test No. 1 would precede Test No. 16. Hence, the data from Test No. 1 would be available for use in Test No. 2. Ford argues that the outcome of Test No. 2 would be unaffected by which test data are used, but that this clarification would simplify test procedures. The agency agrees with Ford's assessment, and this clarification is included in this rule.

General Motors suggested that the term "coated glass" be used instead of "glass-plastic" glazing, in case coatings other than plastic are used in the future. The agency does not believe it is necessary to make such a change at the current time since "glass-plastic" is being used in the industry and is totally descriptive of existing and expected technology.

General Motors also requested that manufacturers be given the option of providing a shorter, permanently etched message on the windshield glass, rather than the cleaning instruction label specified in the proposal, to alert owners regarding the proper cleaning methods for glass-plastic windshields. The agency believes that the cleaning instruction label specified in the proposal is necessary because it would contain more information than would be possible with a permanently etched, short message. The cleaning instruction label included in this rule would identify the product, specify instructions and agents for cleaning the material that will minimize the loss of transparency and instructions for removing frost and ice. The agency recognizes the value of having a permanently etched message on the glass-plastic glazing that refers drivers to the owner's manual for cleaning instructions. Thus, the agency will permit the optional use of permanent labels and urges manufacturers to use them in addition to the cleaning instruction label required by this rule. The agency will continue to monitor the field experience of glass-plastic glazing to determine whether a permanent label should be required.

The agency has determined that there is good cause for an immediate effective date for this rule because it will remove a restriction by permitting, but not requiring, manufacturers to install glass-plastic glazing in all windows of motor vehicles. The agency believes this technology will reduce thousands of lacerative injuries each year. Consequently, an immediate effective date is in the public interest.

The agency has examined the impacts of this amendment and determined that this notice is not major within the meaning of Executive Order 12291 or significant according to the Department's regulatory policies and procedures. The agency has prepared a final regulatory evaluation concerning the amendment, which has been placed in the public docket. (A free copy may be obtained by contacting the Docket Section.) The agency estimates that the consumer cost of glass-plastic glazing would be greater than existing laminated or tempered glass, although it is not possible to determine the exact increase in cost at the current time because this material is not being marketed. The agency estimates, however, that costs could be $38 to $45 greater for glass-plastic windshields. It should be noted that this rule will allow the use of glass-plastic glazing, but not require its use. Therefore, any increase in cost would be determined by the number of manufacturers which choose this alternative material for certain windows in their vehicles. The agency has determined, however, that cost increases to consumers would not be significant within the meaning of Executive Order 12291. Moreover, any increase in cost for this material would be offset to a certain extent by the savings which would accrue because of reduced lacerative injuries resulting from the installation of glass-plastic glazing (with the concomitant reduction in medical and insurance costs).

The agency has also considered the impacts of this rule under the Regulatory Flexibility Act. Few, if any, motor vehicle manufacturers would quality as small entities. Small organizations or governmental units that purchase vehicles equipped with glass-plastic glazing might have to pay a slightly higher price, but this option and its cost increase would be somewhat offset by the accruing savings discussed above. This amendment could have some economic impact on small glazing manufacturers and glazing dealers that would be considered small entities for purposes of the Act. If glass-plastic glazing were to become popular, these small entities might be forced, through competition, to stock the new glazing in their inventories, to provide safe and secure types of storage, to develop new material handling procedures (to protect the plastic inner liners), and to develop new shipment procedures. These possible impacts are all speculative at the current time since the agency has no information to determine how many manufacturers would choose the option of producing and installing glass-plastic glazing, and no information on the magnitude of the above possible impacts or on the likelihood of their occurrence. Based on the agency's judgments regarding information that is currently available, I certify that the option included in this rule would not have a significant economic impact on a substantial number of small entities.

As noted earlier, General Motors, the Maryland State Police, and Ford Motor Company currently have (or will have) test fleets of vehicles equipped with glass-plastic windshields. Experience with these test fleets may provide more information in the future concerning any additional handling costs that are necessary to protect glass-plastic glazing materials. The agency will monitor these impacts as glass-plastic glazing is introduced in the market.

In consideration of the foregoing, Safety Standard No. 205, *Glazing Materials*, (49 CFR 571.205) is amended as set forth below.

1. Paragraph S4 is amended to add the following definition:

"Glass-plastic glazing material" means a laminate of one or more layers of glass and one or more layers of plastic in which a plastic surface of the glazing faces inward when the glazing is installed in a vehicle.

Existing paragraph S5.1.2.3 is designated S5.1.2.4 and revised to read as follows:

Section 5.1.2.4 Cleaning instructions.

(a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, or S5.1.2.3 shall affix a label, removable by hand without tools, to each item of such glazing materials. The label shall identify the product involved, specificy instructions and agents for cleaning the material that will minimize the loss of transparency and instructions for removing frost and ice and, at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manufacturer of glazing materials designed to meet the requirements of paragraph 5.1.2.3 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 inch high, the following words, "GLASS-PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS."

3. A new paragraph S5.1.2.3 is added to read as follows:

Section 5.1.2.3 Item 14—Glass-Plastics. Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.4 and Tests Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), and (d) of this paragraph, may be used anywhere in a motor vehicle, except it may not be used in convertibles, in vehicles that have no roof, or in vehicles whose roofs are completely removable.

(a) Tests Nos. 9, 16, and 18 shall be conducted on the glass side of the specimen, i.e., the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For test No. 19, add the following chemical to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10 percent or less than 5 percent by weight and ammonium hydroxide no greater than 5 percent or less than 1 percent by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of −40°C (±5°) −40°F (±9°) for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentages of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

Issued on November 9, 1983.

Diane K. Steed
Deputy Administrator

48 FR 52061
November 16, 1983

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

[Docket No. 81-04; Notice 5]

ACTION: Final Rule

SUMMARY: This notice amends Standard No. 205, *Glazing materials*, to adopt by reference the 1980 version of American National Standard Z26, the safety code for glazing materials promulgated by the American National Standards Institute. Adoption of the most recent version of Z26 will permit the use of the latest technological developments in glazing. This notice also amends the standard to permit the use of a new type of bullet-resistant glazing material and sets appropriate performance requirements for that glazing. The new glazing would be used in bullet-resistant shields that would be installed inside a vehicle behind the windshields and other areas of the vehicle. Since the new glazing materials are lightweight, small businesses would be able to provide ballistic protection for their employees at a lower cost.

EFFECTIVE DATE: February 23, 1984.

SUPPLEMENTARY INFORMATION: Safety Standard No. 205, *Glazing materials* (49 CFR Part 571.205) sets performance requirements for glazing materials used in motor vehicles and motor vehicle equipment. The standard incorporates by reference the American National Standard Institute's "Safety Code for Safety Glazing Materials for Glazing Motor Vehicle Operating on Land Highways" Z-26.1-1966, as supplemented by Z-26.1a-1969 (ANS Z26). The requirements of Standard No. 205 are set forth in terms of performance tests that the various types or "items" of glazing must meet. Currently there are 14 items of glazing materials permitted under Standard No. 205.

On November 18, 1980, NHTSA granted petitions for rulemaking filed by Rohm and Haas and General Electric (GE). The petitioners requested the agency to amend the standard to incorporate a revised edition of ANS Z26 that was published on January 26, 1977. They said that the revised edition would enable manufacturers to take advantage of the latest technological developments in glazing and would reduce test burdens by eliminating unnecessary testing.

Additionally, GE requested that Standard No. 205 be amended to permit the use of a new type of bullet-resistant glazing, which could be used as a shield in vehicle areas requisite for driving visibility. This transparent barrier would be mounted separately inside the vehicle behind glazing materials that independently comply with the requirements of Standard No. 205. Since the plastic glazing materials are lightweight, GE claimed that small businesses would be able to provide ballistic protection to their employees at a lower cost.

ANS Z26 Revision

Subsequent to the Rohm and Haas and GE petitions, the American National Standards Institute published a 1980 revision to ANS Z26. In July 1982, the agency proposed (47 FR 32749) to incorporate the 1980 revision. (Please refer to the July 29, 1982, notice for an extensive discussion of the provisions of the 1980 version of ANS Z26.)

All commenters supported adoption of the 1980 edition of ANS Z26, citing the advantages gained by using a more modern technical reference. The major benefits of the 1980 version are that it adds metric equivalents to the test procedures and performance requirements, eliminates certain tests which are not necessary to assess the resistance to delamination and light stability of tempered glass, and expands the permissible glazing materials to accommodate technological advances in glazing technology, particularly for bullet-resistant glazing.

The elimination of Humidity Test No. 3 and Boil Test No. 4 for tempered glass will not adversely affect safety. These tests are unnecessary because, unlike laminated glass, which contains intervening layers of glazing materials, tempered glass is a single layer of material and therefore cannot delaminate. Likewise the elimination of ANS Z26 section 5.1.4 of Light Stability Test No. 1 for tempered glass also will not have an adverse safety effect. This section of Test No. 1 is designed to detect decomposition of laminates after exposure to ultraviolet radiation. Since tempered glass does not contain laminates, the test is superfluous. The agency therefore has decided to incorporate by reference the 1980 version of ANS Z26 in Standard No. 205.

Bullet-Resistant Shields

In the July 29, 1982, notice, NHTSA also proposed to amend Standard No. 205 to establish a new item of glazing, "Item 11C." The new item would permit the use of new plastic glazing materials which are lighter and less costly than bullet-resistant glass used on steel-armored vehicles. Use of these lighter glazing materials should increase fuel economy by reducing vehicle weight.

Most commenters favored the use of the new bullet-resistant shields, which would be mounted behind glazing material that also must comply with Standard No. 205. Several manufacturers of armored vehicles and armored-vehicle equipment, however, expressed doubts about the safety, durability, and adequacy of plastic bullet-resistant shields. Those comments are discussed below.

Head Impact

One of the purposes of Standard No. 205 is to reduce glazing-related injuries in motor-vehicle crashes. No commenter specifically addressed the possibility of injuries due to the increased use of bullet-resistant shields made of the new glazing materials. The agency recognizes that bullet-resistant shields are thicker and more rigid than ordinary safety glazing and may cause injury during a crash. However, the same possibility exists for other items of bullet-resistant glazing materials, such as currently used item AS-10 glazing materials.

The agency estimates that the overall effect on occupant injuries due to the use of bullet-resistant shields is minor, since no more than several hundred vehicles per year will be so equipped and the probability of a crash leading to severe injuries is small. The agency also believes that specially armored vehicles are operated by trained drivers who, because of the possibility of having to do sudden high-speed maneuvers, will wear seatbelts while driving. The agency concludes that permitting the use of new bullet-resistant glazing materials represents a reasonable compromise between crash safety and protection from armed attack.

Shield Retention

Several commenters said that bullet-resistant shields are potentially unsafe because the attachment could loosen due to the shock and vibration caused by high-speed maneuvering or could be shot off. Brinks, however, reported that it had not experienced any shock or vibration problem with the bullet-resistant shields it has used.

The agency agrees that the shield attachment must be designed to accommodate shock or vibration. These problems are no different from the problem of designing attachments for other items of automotive glazing for use as windshields or side windows, for example. In the absence of field data showing that there is an actual problem, the agency does not see a need to specify attachment requirements at this time.

Ballistic Adequacy

Goodyear Aerospace expressed concern that the public might be misled as to the ballistic adequacy of the plastic shields. The agency recognizes that there are limitations to the bullet-resistance of any type of glazing. However, all bullet-resistant glazing must meet at least one of the four types of bullet-resistance requirements set forth in Test No. 27 of ANS Z26. Standard No. 205 requires bullet-resistant glazing to be marked to indicate the degree of ballistic protection provided by that particular glazing material. The markings will adequately convey the necessary information to the purchaser, who must then determine whether the shield meets his protection needs.

Light Degradation

Moore and Sons commented that polycarbonate plastics degrade when exposed to ultraviolet radiation. It said that these materials lose their bullet-resisting capability as the plastic continues to be exposed. GE furnished data that illustrated that certain older types of polycarbonates are sensitive to ultraviolet light. However, data gathered on newer, improved versions of polycarbonates, which are coated and ultraviolet-light-stabilized, show substantial resistance to this effect. Purolator, which operates a fleet of armored vehicles, said that its field experience has not found ultraviolet light to cause a problem for the newer polycarbonates.

To insure the ultraviolet-light-resistant performance of bullet-resistant glazing, the agency is adopting in the final rule a requirement that such glazing pass a light-stability test (Test No. 30). Test No. 30 provides an ultraviolet-radiation exposure similar to the light-stability test specified for other glazing materials for use in locations requisite for driving visibility, such as windshields.

Chemical Durability

Moore and Sons also expressed concern that plastic materials could be damaged by ordinary chemicals used in cleaning vehicle interiors. However, Saint-Gobain Vitrage, a manufacturer of automotive glazing, reported that bullet-resistant laminates such as polycarbonates have proved durable after extensive use. GE said that for over 10 years, special U.S. Government vehicles and vehicles designed for use in foreign countries have been equipped with bullet-resistant plastic glazing materials without any reported optical degradation. Based on this information, the agency has concluded that with normal use, plastic ballistic shields meeting the chemical resistance tests set in the final rule should have adequate chemical durability.

In addition, to minimize durability and optical-clarity problems, the agency is requiring manufacturers to provide cleaning instructions on a label on the glazing materials. The instructions will inform owners of the proper choice of cleaning materials and procedure for both cleaning and frost and ice removal. The agency believes that the labels will be adequate to avoid cleaning problems with ballistic shields.

Defogging Problems

Moore and Sons also raised questions about whether the close proximity of the bullet-resistant shield to the vehicle's windshield may cause inadequate defogging and defrosting. Goodyear and GE commented that the defogging or defrosting of the windshield should not be compromised if an air space is maintained between the windshield and the ballistic shield. Since the final rule requires ballistic shields to be installed behind and separate from other glazing materials, the agency does not expect there to be defogging or defrosting problems. Likewise, the final rule requires the ballistic shield to be readily removable, thus making it easy to clean the inside of the windshield and other windows of the vehicles.

Double Vision

Goodyear said that the ballistic shield, because it is mounted behind the windshield, may cause multiple-image problems during nighttime driving. This could occur whenever bright sources of lights, such as headlights, are viewed at an angle through the two separated pieces of glazing. The agency recognizes that the separated glazing materials can cause reflections under certain conditions, leading to an illusion of double vision. The secondary images, however, should be faint, because only a small amount of incoming light is reflected from the surface of a transparent glazing material. As previously mentioned, GE has reported that plastic ballistic shields have been in use for 10 years without any reported optical problems. The agency therefore has concluded that the multiple-image problem, if any, should be minor.

Effective Date

Although the effective date was proposed as 3 months after publication of the final rule, the agency has determined that this delay is not necessary. The portions of the final rule adopting the 1980 version of ANS Z26 will not require glazing-test laboratories to purchase additional test equipment nor require additional training in new test protocols. Since the provision on ballistic shields does not require the use of such glazing, but instead gives the manufacturer the option of using the new glazing, having an immediate date will not impose any burdens on manufacturers. The agency has determined that it is in the public interest to make the new bullet-resistant glazing materials immediately available and therefore has set an immediate effective date for the amendments made by this notice.

Marking

The final rule requires prime glazing-material manufacturers to mark the new bullet-resistant glazing material as "AS 11C" materials. In addition, this rule requires manufacturers of the glass-plastic glazing material permitted by the agency on November 16, 1983 (48 FR 52061) to mark those materials as "AS 14" materials. This marking will help insure that the materials are used in the appropriate locations in motor vehicles.

Costs

The agency has evaluated the economic and other effects of this final rule and determined that they are neither major as defined by Executive Order 12291 nor significant as defined by the Department's Regulatory Policies and Procedures. The agency has determined that the economic effects of this final rule are so minimal that a full regulatory evaluation is not required.

The adoption of the 1980 version of ANS Z26 is likely to reduce costs through the elimination of unnecessary tests. The new bullet-resistant glazing materials permitted by this rule will initially be more costly than conventional bullet-resistant glass. However, the final rule does not mandate the use of the new bullet-resistant shields; it merely gives manufacturers the option of using the new materials. Those materials will only be used on a very limited number of vehicles per year. In addition, although the new materials may initially be more costly, the cost may be offset by reduced vehicle weight and increased fuel economy.

In accordance with the Regulatory Flexibility Act, the agency has evaluated the effects of this action on small entities. As previously discussed, this rule does not mandate the use of the new materials; it permits their use. The rule may assist small businesses by providing ballistic protection to their employees at a lower overall cost. Based on the agency's evaluation, I certify that the final rule will not have a significant economic effect on a substantial number of small entities.

Finally, the agency has analyzed the effects of this action under the National Environmental Policy Act. The agency has determined that the final rule will not have a significant effect on the quality of the human environment.

The information-collection requirements contained in this rule have been submitted to and approved by the the Office of Management and Budget (OMB), pursuant to the requirements of the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 *et seq.*). Those requirements have been approved through September 30, 1985 (OMB #2127-0512).

In consideration of the foregoing, Part 571.205, *Glazing materials*, of Title 49 of the Code of Federal Regulations is amended as follows:

1. Section S4 is amended by adding a new definition to read as follows:

"Bullet-resistant shield" means a shield or barrier that is installed completely inside a motor vehicle behind and separate from glazing materials that independently comply with the requirements of this standard.

2. Paragraph S5.1.1 is revised to read as follows:

S5.1.1 Glazing materials for use in motor vehicles, except as otherwise provided in this standard, shall conform to the American National Standard "Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways" Z-26.1-1977, January 26, 1977, as supplemented by Z26.1a, July 3, 1980 (hereinafter referred to as "ANS Z26"). However, Item 11B glazing as specified in that standard may not be used in motor vehicles at levels requisite for driving visibility, and Item 11B glazing is not required to pass Test Nos. 17, 30, and 31.

3. Paragraph S5.1.2 is revised to read as follows:

S5.1.2 In addition to the glazing materials specified in ANS Z26, materials conforming to S5.1.2.1, S5.1.2.2., S5.1.2.3., or S5.1.2.4 may be used in the locations of motor vehicles specified in those sections.

4. Paragraph S5.1.2.1 is amended to read as follows:

S5.1.2.1 *Item 11C—Safety Glazing Material for Use in Bullet-Resistant Shields.* Bullet-resistant glazing that complies with Test Nos. 2, 17, 19, 20, 21, 24, 27, 28, 29, 30, and 32 of ANS Z26 and the labeling requirements of S5.1.2.5 may be only in bullet-resistant shields that can be removed from the motor vehicle easily for cleaning and maintenance. A bullet-resistant shield may be used in areas requisite for driving visibility only if the combined parallel luminous transmittance with perpendicular incidence through both the shield and the permanent vehicle glazing is at least 60 percent.

5. Paragraph S5.1.2.2 is amended to read as follows:

S5.1.2.2 *Item 12—Rigid Plastics.* Safety-plastic materials that comply with Test Nos. 10, 13, 16, 19, 20, 21, and 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5, may be used in a motor vehicle only in the following specified locations at levels not requisite for driving visibility.

(a) Windows and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield and windows to the immediate right or left of the driver.

(h) Windows and doors in buses, except for the windshield and window to the immediate right and left of the driver.

6. Paragraph S5.1.2.3 is amended to read as follows:

S5.1.2.3. *Item 13—Flexible plastics.* Safety-plastic materials that comply with Tests Nos. 16, 19, 20, 22, and 23 or 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5 may be used in the following specific locations at levels not requisite for driving visibility.

(a) Windows, except forward-facing windows, and doors in slide-in campers and pick-up covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

7. A new paragraph S5.1.2.4 is added to read as follows:

S5.1.2.4 *Item 14—Glass-Plastics.* Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.5 and Test Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), and (d) of this paragraph, may be used anywhere in a motor vehicle, except that they may not be used in convertibles, in vehicles that have no roof, or in vehicles whose roofs are completely removable.

(a) Test Nos. 9, 16, and 18 shall be conducted on the glass side of the specimen, i.e, the surface which would face the exterior of the vehicle. Test Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following chemical to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10 percent or less than 5 percent by weight and ammonium hydroxide no greater than 5 percent or less than 1 percent by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of −40°C(+5°) (−40°F + 9°) for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2.

8. A new paragraph S5.1.2.5 is amended to read as follows:

S5.1.2.5 *Cleaning instructions.* (a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3, or S5.1.2.4 shall affix a label, removable by hand without tools, to each item of such glazing material. The label shall identify the product involved, specify instructions and agents for cleaning the material that will minimize the loss of transparency, and instructions for removing frost and ice, and at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manfacturer of glazing materials designed to meet the requirements of paragraph S5.1.2.4 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than 1/4 inch high, the following words, "GLASS-PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS."

9. The second sentence of the paragraph S6.1 is amended to read as follows:

The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3, and S5.1.2.4 shall be identified by the marks "AS 11C," "AS 12," "AS13," and "AS 14," respectively.

Issued on Feb. 14, 1984.

Diane K. Steed
Administrator

49 FR 6732
February 23, 1984

MOTOR VEHICLE SAFETY STANDARD NO. 205

Glazing Materials

S1. Scope. This standard specifies requirements for glazing materials for use in motor vehicles and motor vehicle equipment.

S2. Purpose. The purpose of this standard is to reduce injuries resulting from impact to glazing surfaces, to ensure a necessary degree of transparency in motor vehicle windows for driver visibility, and to minimize the possibility of occupants being thrown through the vehicle windows in collisions.

S3. Application. This standard applies to glazing materials for use in passenger cars, multipurpose passenger vehicles, trucks, buses, motorcycles, slide-in campers, and pickup covers designed to carry persons while in motion.

S4. Definitions.

[“Bullet resistant shield” means a shield or barrier that is installed completely inside a motor vehicle behind and separate from glazing materials that independently comply with the requirements of this standard. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

“Camper” means a structure designed to be mounted in the cargo area of a truck, or attached to an incomplete vehicle with motive power, for the purpose of providing shelter for persons.

“Motorhome” means a multipurpose passenger vehicle that provides living accommodations for persons.

“Pickup cover” means a camper having a roof and sides but without a floor, designed to be mounted on and removable from the cargo area of a truck by the user.

“Slide-in camper” means a camper having a roof, floor, and sides, designed to be mounted on and removable from the cargo area of a truck by the user.

“Glass-plastic glazing material” means a laminate of one or more layers of glass and one or more layers of plastic in which a plastic surface of the glazing faces inward when the glazing is installed in a vehicle.

S5. Requirements.

S5.1 Materials.

S5.1.1 Glazing materials for use in motor vehicles, except as otherwise provided in this standard, shall conform to the American National Standard “Safety Code for Safety Glazing Materials for Glazing Motor Vehicles Operating on Land Highways,” [Z-26.1-1977, January 26, 1977, as supplemented by Z26.1a, July 3, 1980 (hereinafter referred to as “ANS Z26”). However, Item 11B glazing as specified in that standard may not be used in motor vehicles at levels requisite for driving visibility, and Item 11B glazing is not required to pass Test Nos. 17, 30, and 31. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984).]

S5.1.1.1 The chemicals specified for testing chemical resistance in Tests Nos. 19 and 20 of ANS Z26 shall be:

(a) One percent solution of nonabrasive soap.

(b) Kerosene.

(c) Undiluted denatured alcohol, Formula SD No. 30 (1 part 100-percent methyl alcohol in 10 parts 190-proof ethyl alcohol by volume).

(d) Commercial motor car gasoline.

(Effective: 6/21/72)

S5.1.1.2 The following locations are added to the lists specified in ANS Z26 in which item 4, item 5, item 8 and item 9 safety glazing may be used:

(a)-(i) **[Reserved]**

(j) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(k) Windows and doors in slide-in campers and pickup covers.

(l) Windows and doors in buses except for the windshield, windows to the immediate right or left of the driver, and rearmost windows if used for driving visibility.

(m) For Item 5 safety glazing only: Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

S5.1.1.3 The following locations are added to the lists specified in ANS Z26 in which item 6 and item 7 safety glazing may be used:

(a)-(i) **[Reserved]**

(j) Windows and doors in motorhomes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver.

(k) Windows, except forward-facing windows, and doors in slide-in campers and pickup covers.

(l) For item 7 safety glazing only:

(1) Standee windows in buses.

(2) Interior partitions.

(3) Openings in the roof.

S5.1.1.4 The following locations are added to the lists specified in ANS Z26 in which item 8 and item 9 safety glazing may be used:

(a)-(e) **[Reserved)]**

(f) Windows and doors in motorhomes, except for the windshield and windows to the immediate right or left of the driver.

(g) Windows and doors in slide-in campers and pickup covers.

S5.1.1.5 The phrase "readily removable" window as defined in ANS Z26, for the purposes of this standard, in buses having a GVWR of more than 10,000 pounds, shall include pushout windows and windows mounted in emergency exits that can be manually pushed out of their location in the vehicle without the use of tools, regardless of whether such windows remain hinged at one side to the vehicle.

S5.1.1.6 Multipurpose passenger vehicles. Except as otherwise specifically provided by this standard, glazing for use in multipurpose passenger vehicles shall conform to the requirements for glazing for use in trucks as specified in ANS Z26.

S5.1.1.7 Test No. 17 is deleted from the list of tests specified in ANS Z26 for item 5 glazing material and Test No. 18 is deleted from the lists of tests specified in ANS Z26 for item 3 and item 9 glazing material.

S5.1.2 [In addition to the glazing materials specified in ANS Z26, materials conforming to S5.1.2.1, S5.1.2.2, S5.1.2.3 or S5.1.2.4 may be used in the locations of motor vehicles specified in those sections. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

S5.1.2.1 [Item 11C—Safety Glazing Material for Use in Bullet Resistant Shields. Bullet resistant glazing that complies with Test Nos. 2, 17, 19, 20, 21, 24, 27, 28, 29, 30 and 32 of ANS Z26 and the labeling requirements of S5.1.2.5 may be used only in bullet resistant shields that can be removed from the motor vehicle easily for cleaning and maintenance. A bullet resistant shield may be used in areas requisite for driving visibility only if the combined parallel luminous transmittance with perpendicular incidence through both the shield and the permanent vehicle glazing is at least 60 percent. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

S5.1.2.2 [Item 12—Rigid plastics. Safety plastics materials that comply with Test Nos. 10, 13, 16, 19, 20, 21 and 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5, may be used in a motor vehicle only in the following specified locations at levels not requisite for driving visibility.

(a) Windows and doors in slide-in campers and pickup covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield and windows to the immediate right or left of the driver.

(h) Windows and doors in buses except for the windshield and window to the immediate right and left of the driver. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

S5.1.2.3 [Item 13—Flexible plastics. Safety plastic materials that comply with Tests Nos. 16, 19, 20, 22, and 23 or 24 of ANS Z26, with the exception of the test for resistance to undiluted denatured alcohol Formula SD No. 30, and that comply with the labeling requirements of S5.1.2.5 may be used in the following specific locations at levels not requisite for driving visibility.

(a) Windows, except forward-facing windows, and doors in slide-in campers and pick-up covers.

(b) Motorcycle windscreens below the intersection of a horizontal plane 15 inches vertically above the lowest seating position.

(c) Standee windows in buses.

(d) Interior partitions.

(e) Openings in the roof.

(f) Flexible curtains or readily removable windows or in ventilators used in conjunction with readily removable windows.

(g) Windows and doors in motor homes, except for the windshield, forward-facing windows, and windows to the immediate right or left of the driver. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

S5.1.2.4. [Item 14—Glass-Plastics. Glass-plastic glazing materials that comply with the labeling requirements of S5.1.2.5 and Tests Nos. 1, 2, 3, 4, 9, 12, 15, 16, 17, 18, 19, 24, 26, and 28, as those tests are modified in (a), (b), (c), and (d) of this paragraph, may be used anywhere in a motor vehicle, except that it may not be used in convertibles, in vehicles that have no roof or in vehicles whose roofs are completely removable.

(a) Tests Nos. 9, 16, and 18 shall be conducted on the glass side of the specimen, i.e., the surface which would face the exterior of the vehicle. Tests Nos. 17, 19, 24, and 26 shall be conducted on the plastic side of the specimen, i.e., the surface which would face the interior of the vehicle. Test No. 15 should be conducted with the glass side of the glazing facing the illuminated box and the screen, respectively. For Test No. 19, add the following chemical to the specified list: an aqueous solution of isopropanol and glycol ether solvents in concentration no greater than 10% or less then 5% by weight and ammonium hydroxide no greater than 5% or less than 1% by weight, simulating typical commercial windshield cleaner.

(b) Glass-plastic specimens shall be exposed to an ambient air temperature of −40°C ±5° (−40°F ±9°) for a period of 6 hours at the commencement of Test No. 28, rather than at the initial temperature specified in that test. After testing, the glass-plastic specimens shall show no evidence of cracking, clouding, delaminating, or other evidence of deterioration.

(c) Glass-plastic specimens tested in accordance with Test No. 17 shall be carefully rinsed with distilled water following the abrasion procedure and wiped dry with lens paper. After this procedure, the arithmetic mean of the percentage of light scattered by the three specimens as a result of abrasion shall not exceed 4.0 percent.

(d) Data obtained from Test No. 1 should be used when conducting Test No. 2. (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

[S5.1.2.5 Cleaning instructions.

(a) Each manufacturer of glazing materials designed to meet the requirements of S5.1.2.1, S5.1.2.2, S5.1.2.3 or S5.1.2.4 shall affix a label, removable by hand without tools, to each item of such glazing materials. The label shall identify the product involved, specify instructions and agents for cleaning the material that will minimize the loss of transparency and instructions for removing frost and ice and, at the option of the manufacturer, refer owners to the vehicle's Owner's Manual for more specific cleaning and other instructions.

(b) Each manufacturer of glazing materials designed to meet the requirements of paragraph 5.1.2.4 may permanently and indelibly mark the lower center of each item of such glazing material, in letters not less than 3/16 inch nor more than ¼ inch high, the following words, "GLASS PLASTIC MATERIAL—SEE OWNER'S MANUAL FOR CARE INSTRUCTIONS." (49 F.R. 6732—February 23, 1984. Effective: February 23, 1984)]

S5.2 Edges. In vehicles except school buses, exposed edges shall be treated in accordance with SAE Recommended Practice J673a, "Automotive Glazing," August 1967. In school buses, exposed edges shall be banded.

S6. Certification and marking.

S6.1 Each prime glazing material manufacturer, except as specified below, shall mark glazing materials manufactured by him in accordance with section 6 of ANS Z26. [The materials specified in S5.1.2.1, S5.1.2.2, S5.1.2.3 and S5.1.2.4 shall be identified by the marks "AS 11C", "AS 12", "AS 13" and "AS 14" respectively.] A prime glazing material manufacturer is one who fabricates, laminates, or tempers the glazing material. (49 F.R. 6732—February 23 1984. Effective: February 23,1984.)

S6.2 Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed as a component of any specific motor vehicle or camper, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act of 1966, by adding to the mark required by S6.1 in letters and numerals of the size specified in section 6 of ANS Z26, the symbol "DOT" and a manufacturer's code mark, which will be assigned by the NHTSA on the written request of the manufacturer.

S6.3 Each prime glazing material manufacturer shall certify each piece of glazing material to which this standard applies that is designed to be cut into components for use in motor vehicles or items of motor vehicle equipment, pursuant to section 114 of the National Traffic and Motor Vehicle Safety Act.

S6.4 Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall mark that material in accordance with section 6 of ANS Z26.

S6.5 Each manufacturer or distributor who cuts a section of glazing material to which this standard applies, for use in a motor vehicle or camper, shall certify that his product complies with this standard in accordance with section 114 of the National Traffic and Motor Vehicle Safety Act.

37 F.R. 12237
June 21, 1972

PREAMBLE TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles, and Trucks

(Docket No. 2–16)

A proposal to further amend Federal Motor Vehicle Safety Standard No. 206, extending its applicability to multipurpose passenger vehicles and trucks, was published in the *Federal Register* on December 28, 1967 (32 F.R. 20868).

Interested persons have been afforded an opportunity to participate in the making of this amendment. Their comments and other available information have been carefully considered.

Ejection from passenger cars and trucks, upon impact, has proven to be a primary cause of occupant injury and death. Standard No. 206 was issued to minimize the likelihood of occupants being thrown from passenger cars by providing, among other things, load requirements for door latches and door hinge systems. A study conducted by the Cornell Aeronautical Laboratory disclosed that the rate of occupant ejection from trucks is almost twice that of recent-model passenger cars. Moreover, the study revealed that the rate of severe and fatal injuries among truck drivers who have been thrown from vehicles is four times that of drivers who remained in the vehicle after impact. Extending the requirements of Standard 206 to trucks and multipurpose passenger vehicles clearly meets the need for motor vehicle safety. This conclusion is concurred in generally by the commenters.

Several changes have been made in the text of the standard from that which appeared in the Notice of Proposed Rule Making. The title of the standard has been changed to more accurately describe the items dealt with in the standard. In addition, in response to some of the comments submitted, the category of side doors previously referred to as "hinged doors" has been divided into two new groups—"hinged cargo-type doors" and "hinged doors except cargo-type doors," and separate load requirements and demonstration procedures have been prescribed for each. In light of other comments submitted, the demonstration procedure for "sliding doors" has also been changed for reasons of practicability. Further, a definition of the term "cargo-type doors" has been inserted in the standard. The term "temporary doors" referred to and defined in the notice has been deleted. Finally, several other changes have been made for clarification purposes only.

No multipurpose passenger vehicle manufacturer objected to the proposed effective date of this amendment, January 1, 1970. On the other hand, one heavy truck manufacturer specifically objected to the proposed effective date on the ground that additional lead time would be needed to redesign, test, and retool, in order to comply with the amended standard. Several other truck manufacturers also considered the lead time to be insufficient. A January 1, 1972 effective date for trucks was proposed by the aforesaid heavy truck manufacturer. The Administrator concludes that there is merit to his objection. Heavy truck manufacturers will require more time than was originally anticipated to take the steps necessary to comply with the standard. Accordingly, the effective date of this amendment, insofar as trucks are concerned, is extended to January 1, 1972.

In consideration of the foregoing, Federal Motor Vehicle Safety Standard No. 206, as amended, 49 C.F.R. § 371.21, is amended to read as set forth below, effective January 1, 1970, for passenger cars and multipurpose passenger vehicles, and January 1, 1972, for trucks.

This rule-making action is taken under authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority contained in Part I of the Regulations of the Office of the Secretary of Transportation (49 CFR 1.4(c)).

Issued on January 17, 1969.

Lowell K. Bridwell,
Federal Highway Administrator

34 F.R. 1150
January 24, 1969

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles and Trucks

(Docket No. 2–16)

Federal Motor Vehicle Safety Standard No. 206 (49 CFR 371.21), as amended (34 F.R. 1151), specifies strength requirements for door locks and door retention components on passenger cars, multipurpose passenger vehicles, and trucks.

Paragraph S4. of Standard 206 exempts components of detachable doors for vehicles manufactured for use without doors from the requirements of the standard. This was done because such doors are provided not for the purpose of retaining the driver and passengers in case of collision but only as protection from inclement weather.

One manufacturer has noted that strength requirements are equally inapplicable to components of folding and roll-up doors and has petitioned for an amendment which would treat such doors in the same manner as detachable doors. It has been determined that the petition has merit. Accordingly, the standard is amended to remove folding and roll-up doors from the requirements of the standard.

In consideration of the foregoing, paragraph S4. of Federal Motor Vehicle Safety Standard No. 206 is amended to read as follows:

S4. *Requirements.* Side door components referred to herein shall conform to this standard if any portion of a 90-percentile two-dimensional manikin as described in SAE Practice J826, when positioned at any seating reference point, projects into the door opening area on the side elevation or profile view. Components on folding doors, roll-up doors and doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors need not conform to this standard.

* * * * *

Correction: The paragraph title "S5.2.3 "*Sliding Doors*" of Federal Motor Vehicle Safety Standard No. 206 is changed to read "S5.3 *Sliding Doors*".

Since this amendment relaxes a requirement and imposes no additional burden on any person, notice and opportunity to comment thereon are unnecessary, and it becomes effective on publication in the *Federal Register.* This notice of amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority from the Secretary of Transportation to the Federal Highway Administrator, 49 CFR 1.4(c).

Issued on August 14, 1969.

F. C. Turner
Federal Highway Administrator

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD NO 206

Door Locks and Retention Components

(Docket No. 71–5; Notice 2)

The purpose of this notice is to amend Standard No. 206, Door Locks and Door Retention Components, to require that all side doors leading into a passenger compartment containing one or more seating accommodations meet the requirements of the standard, regardless of seat location or whether the seats are within the definition of designated seating positions. This notice also amends the standard to make clear the distinction between front and rear doors.

I. A notice of proposed rulemaking proposing the extension of the requirements of the standard to all side doors leading into passenger compartments was published in the Federal Register on February 3, 1971 (36 F.R. 1913). The three comments which were received in response to the notice were carefully considered. All of them supported the proposed amendment. The amendment in this notice is identical to the proposed amendment except for the effective date. That date has been changed to September 1, 1972 to permit adequate time for compliance.

II. The standard specifies in S4.1.3 different door lock requirements for front and rear doors. The Standard does not, however, precisely differentiate between these two types of doors. The problem of determining whether a door is to be treated as a front door or rear door arises particularly in connection with multipurpose passenger vehicles having a single right side door.

To clarify the application of the requirements of S4.1.3, this notice amends the Standard by adding the word "Side" to the titles of S4.1.3.1 and S4.1.3.2 and by adding definitions of "Side front door" and "Side rear door" to S3. The definitions adopt, as the reference point for differentiating between front and rear doors, the rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position. A door with 50 percent or more of its opening area in a side view forward of that point is a "side front door". A door with more than 50 percent of its opening area in a side view to the rear of that point is a "side rear door".

These amendments to Standard No. 206 are clarifying and interpretive in nature. Consequently, it is found that notice and opportunity to comment are unnecessary and that, for good cause shown, an effective date earlier than 30 days after issuance is in the public interest.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 206, § 571.206 of title 49, Code of Federal Regulations, is amended....

Effective dates: Amendment 1. concerning the application of the standard is effective September 1, 1972. Amendment 2. through 4. concerning the distinction between front and rear doors are effective January 8, 1972.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act of 1966 (15 U.S.C. 1392, 1407) and the delegation of authority at 49 CFR 1.51.

Issued on January 4, 1972.

Douglas W. Toms
Administrator

37 F.R. 284
January 8, 1972

PREAMBLE TO AN AMENDMENT TO FEDERAL MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components

[Docket No. 84-09; Notice 2]

ACTION: Final rule.

SUMMARY: The purpose of this notice is to amend Federal Motor Vehicle Safety Standard No. 206, *Door Locks and Door Retention Components*, to expand the list of doors that need not conform to the requirements of the standard. Added to the list are doors with wheelchair lifts that are provided with an audible or visual alarm which signals the driver when the door is unsecured and the ignition is in the "on" position. When in its stowed position, a wheelchair lift barricades the door and prevents occupant ejection from the vehicle if the door were to open while the vehicle is in motion or involved in a collision. The alarm ensures that the wheelchair lift is in its retracted position and the door is shut while the vehicle is in operation. This final rule completes a rulemaking action commenced when a manufacturer requested an exemption from the requirements of Standard No. 206.

EFFECTIVE DATE: July 25, 1985.

SUPPLEMENTARY INFORMATION: Paragraph S4 of Federal Motor Vehicle Safety Standard (FMVSS) No. 206, *Door Locks and Door Retention Components*, excludes from its requirements components on folding doors, roll-up doors, and doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors. Thomas Built Buses, Inc., (hereinafter referred to as "Thomas") requested that Standard No. 206 be amended to exclude from its requirements multipurpose passenger vehicles which are equipped with wheelchair lifts and which are designed for wheelchair occupants.

On September 26, 1984, the agency published a notice of proposed rulemaking (NPRM) in the *Federal Register* (49 FR 37813) which proposed to exclude from the standard's requirements doors with wheelchair lifts that are provided with audible alarms. The notice explained that the agency was proposing to expand the list of excluded doors to include side doors equipped with wheelchair lifts and audible alarms because the wheelchair lifts barricade the door of the vehicle if the door were to open while the vehicle is in motion or involved in a collision. The agency believed that it was unnecessary to require these doors to comply with the requirements of the standard, since the lifts would prevent ejection of the vehicle's occupants, and since there would be an alarm which would ensure that the door is closed and the lift is in its retracted position.

The NPRM explained that wheelchair lifts are designed so that they are secured in the retracted position by either hydraulic pressure in the extension/retraction cylinders and mechanical latches, or by electrically operated drive mechanisms. Metal grate floors of lifts are stowed in a vertical position parallel to and in close proximity with the interior surface of the door of the vehicle. In its retracted position, the wheelchair lift could provide an adequate barrier to occupant ejection from the vehicle if the door were to open while the vehicle is in motion or involved in a collision. An alarm system which is activated if the door is opened while the ignition is in the "on" position would ensure that the wheelchair lift is in its retracted position and the door is shut while the vehicle is in operation.

One comment to the proposal was received by the agency. The commenter generally supported the proposed amendment but suggested two changes. The first suggestion was that a visual alarm, such as a flashing visible signal located in the driver's compartment, be allowed as an alternative to the audible alarm proposed by the NPRM. The commenter explained that an audible alarm which is activated the entire time the lift door is open could be disturbing to special-education passengers.

The agency agrees that a visual alarm conspicuous to the driver would ensure that the wheelchair-lift door is latched and secured. This meets the intent of the requirement for an alarm system, and accommodates the needs of special-education passengers. This final rule thus adopts the first of the commenter's requested changes by allowing an alarm system consisting of either a visual signal located in the driver's compartment, or an alarm audible to the driver.

The second change requested by the commenter was that the amendment apply to all wheelchair-lift doors whether or not a lift is installed at the time the vehicle is certified. The commenter explained that it is common in the industry for a vehicle manufacturer to build and deliver a vehicle to a distributor with just the lift door installed. The distributor then installs the wheelchair lift prior to delivery to the purchaser.

The agency does not agree that this change should be made to Standard No. 206. This amendment exempts doors equipped with wheelchair lifts and alarm systems because the lifts in their retracted position provide an adequate barrier to occupant ejection if the door were to open while the vehicle is in operation or involved in a collision. The agency believes that manufacturers should be prohibited from certifying their vehicles as complying with FMVSS No. 206 if the doors of those vehicles do not contain wheelchair lifts and alarm systems or locks and door-retention components which conform to Standard No. 206.

The agency notes that under NHTSA's requirements set forth in 49 CFR Part 568, *Vehicles Manufactured in Two or More Stages,* the commenter, as the incomplete-vehicle manufacturer, is not prohibited from delivering the vehicle to the distributor without the lift installed. Under Part 568, the distributor or other person installing the lift would be considered the final-stage manufacturer. The incomplete-vehicle manufacturer must furnish a document that explains the specific conditions of final manufacture under which the completed vehicle will conform to the applicable safety standards, which would include FMVSS No. 206. As the final-stage manufacturer, the distributor can install the lift and certify the vehicle as complying with all applicable safety standards.

The agency has considered the comments on the NPRM and has amended FMVSS No. 206 to exclude from the requirements of the standard doors which contain wheelchair lifts that are provided with an alarm system consisting of either a flashing visible signal located in the driver's compartment or an alarm audible to the driver, which is activated when the door is open. The alarms must be sufficient to alert the driver when the door is open, i.e., the audible alarm must be loud enough to be heard and the visual alarm must be conspicuous and located in the driver's compartment. This amendment excludes such doors on passenger cars, multipurpose passenger vehicles, such as vans, and trucks.

Part 571-Federal Motor Vehicle Safety Standards
§571.206 [Amended]

In consideration of the foregoing, 49 CFR 571.206, *Door Locks and Door Retention Components,* is amended as follows:

S4 is revised to read as follows:

* * * * *

S4. *Requirements.* Components on any side door leading directly into a compartment that contains one or more seating accommodations shall conform to this standard. However, components on folding doors, roll-up doors, doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors, and side doors which are equipped with wheelchair lifts and which are linked to an alarm system consisting of either a flashing visible signal located in the driver's compartment or an alarm audible to the driver which is activated when the door is open, need not conform to this standard.

Issued on March 21, 1985.

Diane K. Steed
Administrator

50 FR 12029
March 27, 1985

MOTOR VEHICLE SAFETY STANDARD NO. 206

Door Locks and Door Retention Components—Passenger Cars, Multipurpose Passenger Vehicles, and Trucks

S1. Purpose and scope. This standard specifies requirements for side door locks and side door retention components including latches, hinges, and other supporting means, to minimize the likelihood of occupants being thrown from the vehicle as a result of impact.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, and trucks.

S3. Definitions. "Cargo-Type Door" means a door designed primarily to accommodate cargo loading including, but not limited to, a two-part door that latches to itself.

"Side front door" means a door that in a side view, has 50 percent or more of its opening area forward of the rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position.

"Side rear door" means a door that, in a side view, has more than 50 percent of its opening area to the rear of the rearmost point on the driver's seatback, when the driver's seat is adjusted to its most vertical and rearward position.

S4. Requirements. [Components on any side door leading directly into a compartment that contains one or more seating accommodations shall conform to this standard. However, components on folding doors, roll-up doors, doors that are designed to be easily attached to or removed from motor vehicles manufactured for operation without doors, and side doors which are equipped with wheelchair lifts and which are linked to an alarm system consisting of either a flashing visible signal located in the driver's compartment or an alarm audible to the driver which is activiated when the door is open, need not conform to this standard. (50 F.R. 12031—March 27, 1985. Effective: July 25, 1985)]

S4.1 Hinged Doors, Except Cargo-Type Doors.

S4.1.1 Door Latches. Each door latch and striker assembly shall be provided with two positions consisting of—

(a) A fully latched position; and

(b) A secondary latched position.

S4.1.1.1 Longitudinal Load. The door latch and striker assembly, when in the fully latched position, shall not separate when a longitudinal load of 2,500 pounds is applied. When in the secondary latched position, the door latch and striker assembly shall not separate when a longitudinal load of 1,000 pounds is applied.

S4.1.1.2 Transverse Load. The door latch and striker assembly, when in the fully latched position, shall not separate when a transverse load of 2,000 pounds is applied. When in the secondary latched position, the door latch and striker assembly shall not separate when a transverse load of 1,000 pounds is applied.

S4.1.1.3 Inertia Load. The door latch shall not disengage from the fully latched position when a longitudinal or transverse inertia load of 30g is applied to the door latch system (including the latch and its actuating mechanism with the locking mechanism disengaged).

S4.1.2 Door Hinges. Each door hinge system shall support the door and shall not separate when a longitudinal load of 2,500 pounds is applied. Similarly, each door hinge system shall not separate when a transverse load of 2,000 pounds is applied.

S4.1.3 Door Locks. Each door shall be equipped with a locking mechanism with an operating means in the interior of the vehicle.

S4.1.3.1 Side Front Door Locks. When the locking mechanism is engaged, the outside door handle or other outside latch release control shall be inoperative.

S4.1.3.2 Side Rear Door Locks. In passenger cars and multipurpose passenger vehicles, when the locking mechanism is engaged, both the outside and inside door handles or other latch release controls shall be inoperative.

S4.2 Hinged Cargo-Type Doors.

S4.2.1 Door Latches.

S4.2.1.1 Longitudinal Load. Each latch system, when in the latched position, shall not separate when a longitudinal load of 2,500 pounds is applied.

S4.2.1.2 Transverse Load. Each latch system, when in the latched position, shall not separate when a transverse load of 2,000 pounds is applied. When more than one latch system is used on a single door, the load requirement may be divided among the total number of latch systems.

S4.2.2 Door Hinges. Each door hinge system shall support the door and shall not separate when a longitudinal load of 2,500 pounds is applied, and when a transverse load of 2,000 pounds is applied.

S4.3 Sliding Doors. The track and slide combination or other supporting means for each sliding door shall not separate when a total transverse load of 4,000 pounds is applied, with the door in the closed position.

S5. Demonstration Procedures.

S5.1 Hinged Doors, Except Cargo-Type Doors.

S5.1.1 Door Latches.

S5.1.1.1 Longitudinal and Transverse Loads. Compliance with paragraphs S4.1.1.1 and S4.1.1.2 shall be demonstrated in accordance with paragraph 4 of Society of Automotive Engineers Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965.

S5.1.1.2 Inertia Load. Compliance with S4.1.1.3 shall be demonstrated by approved tests or in accordance with paragraph 5 of SAE Recommended Practice J839b, May 1965.

S5.1.2 Door Hinges. Compliance with S4.1.2 shall be demonstrated in accordance with paragraph 4 of SAE Recommended Practice J934, "Vehicle Passenger Door Hinge Systems," July 1965. For piano-type hinges, the hinge spacing requirements of SAE J934 shall not be applicable and arrangement of the test fixture shall be altered as required so that the test load will be applied to the complete hinge.

S5.2 Hinged Cargo-Type Doors.

S5.2.1 Door Latches. Compliance with S4.2.1 shall be demonstrated in accordance with paragraphs 4.1 and 4.3 of SAE Recommended Practice J839b, "Passenger Car Side Door Latch Systems," May 1965. An equivalent static test fixture may be substituted for that shown in Figure 2 of SAE J839, if required.

S5.2.2 Door Hinges. Compliance with S4.2.2 shall be demonstrated in accordance with paragraph 4 of SAE Recommended Practice J934, "Vehicle Passenger Door Hinge Systems," July 1965. For piano-type hinges, the hinge spacing requirement of SAE J934 shall not be applicable and arrangement of the test fixture shall be altered as required so that the test load will be applied to the complete hinge.

S5.3 Sliding Doors. Compliance with S4.3 shall be demonstrated by applying an outward transverse load of 2,000 pounds to the load bearing members at the opposite edges of the door (4,000 pounds total). The demonstration may be performed either in the vehicle or with the door retention components in a bench test fixture.

34 F.R. 1150
January 24, 1969

PREAMBLE TO MOTOR VEHICLE SAFETY STANDARD 207

Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

(Docket No. 2–12; Notice No. 3)

The purpose of this amendment to Motor Vehicle Safety Standard No. 207 is to extend its application to multipurpose passenger vehicles, trucks and buses, to require a seat to remain in its adjusted position during load application, and to clarify and restructure the standard.

A notice of proposed rulemaking on the subject of amending Motor Vehicle Safety Standard No. 207, and extending it to multipurpose passenger vehicles, trucks and buses was published on September 20, 1969 (34 F.R. 14661).

The need for adequately anchored seating is clear. A seat that tears loose on impact adds to the hazards that are inherent in crash situations. Each seat must remain in place if it is to afford any protection to its occupant. Standard No. 207 accordingly established strength requirements for the anchorage of occupant seats, required that a means be provided for keeping folding seats and seat backs in place, and prescribed strength requirements for seat backs and seat back restraints. The proposal to extend the standard's application to additional types of vehicles is part of an overall effort to afford occupants of these vehicles protection equal to that now available to occupants of passenger cars. The extension of Standard No. 207 is closely allied with the extension of standards for seat belt installation (208) and anchorages (210) to these other vehicle types.

Most of the comments favored the extended application of the standard. Some persons who objected voiced the fear that the seat system requirements would eliminate some seating configurations in multipurpose passenger vehicles and walk-in van-type trucks. Although manufacturers of these vehicles may have to make design changes, it has been determined that strength and convenience in this case are not incompatible, and that the provision of adequate seats is not impracticable for such vehicles. It should also be noted that if a seat is not intended for use while the vehicle is in motion, and therefore provides no designated seating position under the amended definition of that term in section 571.3 of Title 49 CFR, the requirements of this standard do not apply to it.

Several respondents observed that the requirements of S4.2 that a seat sustain the required force "in each position to which it can be adjusted" would impose a substantial burden on power seats, whose "positions" may be very numerous. The intent of the paragraph is to insure that a seat would be able to sustain the specified force in any position that is usable in actual operations, although the manufacturer may choose to test it only in its most vulnerable positions. Thus, the manufacturer may use whatever means are at his disposal to meet the minimum requirements; the standards are not intended to dictate either the nature or the quantity of manufacturer testing. The requirement has been reworded slightly and language has been added to make it clear that the force specified by subparagraph (d) is applied to the seat only in the rearmost position.

The requirement that the seat withstand the load without leaving its adjusted position has been retained, but in response to another group of comments it has been decided to allow nonlocking suspension type seats to travel normally during application of the loads required by S4.2. Any other method of testing would not accurately reflect the actual performance characteristics of such seats.

Several comments questioned the utility of requiring a seat back restraint release to be readily accessible if its use is not required for normal exit from the vehicles. There appears to be merit to this argument with respect to the need for rear seat occupants to use the release and the paragraph has been altered accordingly.

One comment stated that subparagraph S4.3.2.1 of the proposal should be amended to require the restraint on a rearward-facing seat to withstand a rearward load equal to eight times the weight of the pivoting or folding portion of the seat. This suggestion has merit, and the subparagraph has been amended by the addition of a new subparagraph dealing expressly with rearward-facing seats.

Several comments requested that addition of language permitting "approved physical demonstrations" or "approved dynamic tests" in place of the static loading requirements in S4.2 and S4.3. For several reasons, that language has not been added to the amended Standard No. 207. The Bureau adheres to the procedures specified in the standard in its own testing, and it is therefore essential that the procedures be set forth with precision. However, if a manufacturer develops test procedures which are equal to those in the standard, in the sense that the results can be accurately correlated with the standard's requirements, nothing in the Act or in the standard prevents him from using his tests to determine that his product conforms to the standard. The Bureau wishes to encourage new developments in the field of testing, and does not intend that the amended standard should inhibit them.

The proposal has been further changed by incorporating the substance of the test procedures in SAE J879b into the text of the standard and by adopting the accompanying drawings as figures 1–5 of the standard.

Effective date: January 1, 1972.

Several comments indicated that the proposed effective date of January 1, 1971, would leave many manufacturers unable to comply, particularly with respect to multipurpose passenger vehicles and trucks. Therefore, it has been determined that there is good cause for specifying an effective date more than 1 year after the date of publication.

Issued on September 23, 1970.

Charles H. Hartman,
Acting Director.

35 F.R. 15290
October 1, 1970

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 207

Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 2–12; Notice No. 4)

An amendment to Motor Vehicle Safety Standard No. 207, Seating Systems, was published on October 1, 1970 (35 F.R. 15290). Thereafter, pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119), petitions for reconsideration were filed by the Ford Motor Company and Rolls Royce, Ltd.

The petition of Rolls Royce, Ltd., sought to amend § S4.2.1, *Seat adjustment*, to permit a displacement of 2 inches during the application of the required force. The company stated that such an allowance was necessary to accommodate power seats that are continuously adjustable. Although the Administration has determined that it is not advisable to permit a specific displacement, the special circumstances of the power seat warrant a more explicit interpretation of the term "adjusted position" as employed in the standard.

Some types of manual adjustment device have a small amount of slack, that is detected during the test procedure but is not an indication of incipient failure and is therefore not considered to affect the conformity of the system. In reviewing the characteristics of power adjustment devices, the Administration has concluded that some similar amount of slack may exist in such systems and that it should not be the basis for a finding of non-conformity. The Administration will consider a continuously adjustable power seat to have remained in its adjusted position despite some movement, if the movement is small and if it has stopped as the maximum required force level is reached.

The substance of the Ford petition was that the requirement for the seat back release control to be accessible to an occupant of the seat is not appropriate if the occupant does not need to use it to exit from the vehicle. This point was illustrated by the case of a seat in a truck cab that folds for access to a storage compartment. The Administration has determined that the situation used by Ford to illustrate its case is a situation in which relief from the requirement should be granted, but that where there is a seating position behind the folding seat the release control should continue to be accessible to the occupant of the folding seat. This requirement has been a part of the standard from the outset, and by making the latch more easily usable makes it less likely to be intentionally defeated.

Ford also indicated that it understood the standard to require that the seat be releasable from each seating position on the seat. This is not a correct reading of the standard. The Administration's interpretation continues to be that the release conrol must be accessible to at least one occupant of each folding part of a seat.

In consideration of the foregoing, section S4.3.1, *Accessibility of release control*, in Standard No. 207, 49 CFR 571.21, is amended. . . .

Effective date: January 1, 1972.

Issued on April 14, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 7419
April 20, 1971

MOTOR VEHICLE SAFETY STANDARD NO. 207

Seating Systems—Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 2-12; Notice No. 3)

S1. Purpose and scope. This standard establishes requirements for seats, their attachment assemblies, and their installation to minimize the possibiilty of their failure by forces acting on them as a result of vehicle impact.

S2. Application. This standard applies to passenger cars, multipurpose passenger vehicles, trucks and buses.

S3. Definition. "Occupant seat" means a seat that provides at least one designated seating position.

S4. Requirements.

S4.1 Driver seat. Each vehicle shall have an occupant seat for the driver.

S4.2 General performance requirements. When tested in accordance with S5, each occupant seat, other than a side-facing seat or a passenger seat on a bus, shall withstand the following forces:

(a) In any position to which it can be adjusted—20 times the weight of the seat applied in a forward longitudinal direction;

(b) In any position to which it can be adjusted—20 times the weight of the seat applied in a rearward longitudinal direction;

(c) For a seat belt assembly attached to the seat—the force specified in subparagraph (a), if it is a forward facing seat, or subparagraph (b), if it is a rearward facing seat, in each case applied simultaneously with the forces imposed on the seat by the seat belt assembly when it is loaded in accordance with section S4.2 of Federal Motor Vehicle Safety Standard No. 210; and

(d) In its rearmost position—a force that produces a 3,300 inch-pound moment about the seating reference point for each designated seating position that the seat provides, applied to the upper cross-member of the seat back or the upper seat back, in a rearward longitudinal direction for forward-facing seats and in a forward longitudinal direction for rearward-facing seats.

S4.2.1 Seat adjustment. Except for vertical movement of nonlocking suspension type occupant seats in trucks or buses, the seat shall remain in its adjusted position during the application of each force specified in S4.2.

S4.3 Restraining device for hinged or folding seats or seat backs. Except for a passenger seat in a bus or a seat having a back that is adjustable only for the comfort of its occupants, a hinged or folding occupant seat or occupant seat back shall be equipped with a self-locking device for restraining the hinged or folding seat or seat back and a control for releasing that restraining device.

S4.3.1 Accessibility of release control. If there is a designated seating position immediately behind a seat equipped with a restraining device, the control for releasing the device shall be readily accessible to the occupant of the seat equipped with the device and, if access to the control is required in order to exit from the vehicle, to the occupant of the designated seating position immediately behind the seat.

S4.3.2 Performance of restraining device.

S4.3.2.1 Static force.

(a) Once engaged, the restraining device for forward-facing seat shall not release or fail when a forward longitudinal force equal to 20 times the weight of the hinged or folding portion of the seat is applied through the center of gravity of that portion of the seat.

(b) Once engaged, the restraining device for a rearward facing seat shall not release or fail when a rearward longitudinal force equal to 8 times the weight of the hinged or folding portion of the seat is applied to the center of gravity of that portion of the seat.

S4.3.2.2 Acceleration. Once engaged, the restraining device shall not release or fail when the device is subjected to an acceleration of 20 g. in the longitudinal direction opposite to that in which the seat folds.

S4.4 Labeling. Seats not designated for occupancy while the vehicle is in motion shall be conspicuously labeled to that effect.

S5. Test procedures.

S5.1 Apply the forces specified in S4.2(a) and S4.2(b) as follows:

S5.1.1 If the seat back and the seat bench are attached to the vehicle by the same attachments, secure a strut on each side of the seat from a point on the outside of the seat frame in the horizontal plane of the seat's center of gravity to a point on the frame as far forward as possible of the seat anchorages. Between the upper ends of the struts place a rigid cross-member, in front of the seat back frame for rearward loading and behind the seat back frame for forward loading. Apply the force specified by S4.2(a) or S4.2(b) horizontally through the rigid cross-member as shown in Figure 1.

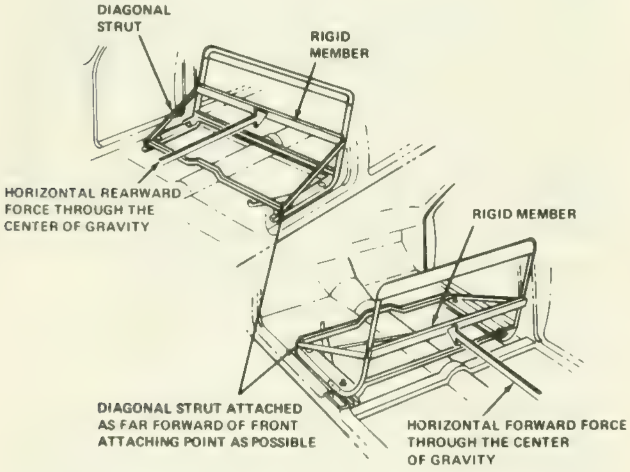
DIAGONAL STRUT
RIGID MEMBER
HORIZONTAL REARWARD FORCE THROUGH THE CENTER OF GRAVITY
RIGID MEMBER
DIAGONAL STRUT ATTACHED AS FAR FORWARD OF FRONT ATTACHING POINT AS POSSIBLE
HORIZONTAL FORWARD FORCE THROUGH THE CENTER OF GRAVITY

FIGURE 1

S5.1.2 If the seat back and the seat bench are attached to the vehicle by different attachments, attach to each component a fixture capable of transmitting a force to that component. Apply forces equal to 20 times the weight of the seat back horizontally through the center of gravity of the seat back, as shown in Figure 2, and apply forces equal to 20 times the weight of the seat bench horizontally through the center of gravity of the seat bench, as shown in Figure 3.

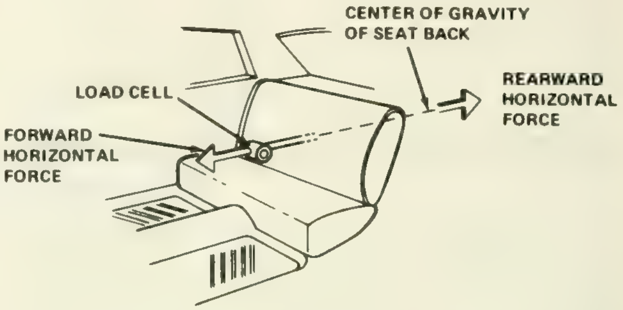

FIGURE 2

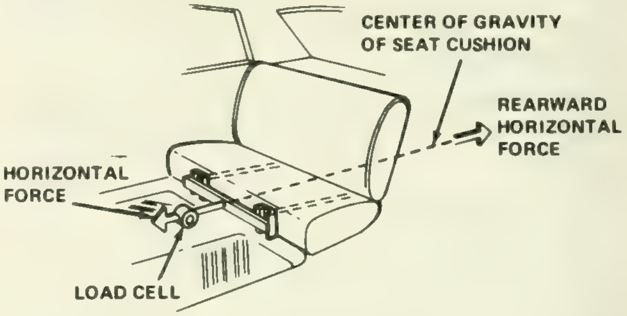

FIGURE 3

S5.2 Develop the moment specified in S4.2(d) as shown in Figure 4.

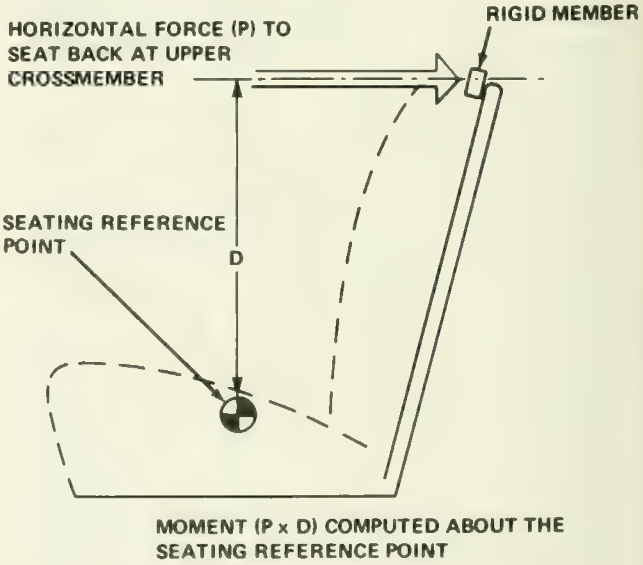
HORIZONTAL FORCE (P) TO SEAT BACK AT UPPER CROSSMEMBER
RIGID MEMBER
SEATING REFERENCE POINT
D
MOMENT (P x D) COMPUTED ABOUT THE SEATING REFERENCE POINT

FIGURE 4

S5.3 Apply the forces specified in S4.3.2.1 (a) and (b) to a hinged or folding seat as shown in figure 1 and to a hinged or folding seat back as shown in Figure 5.

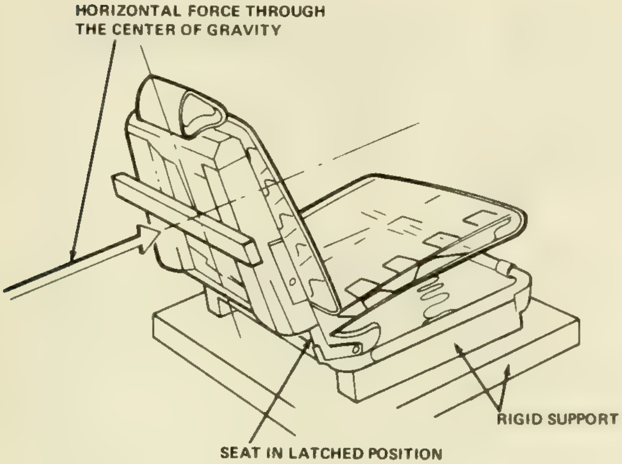

FIGURE 5

S5.4 Determine the center of gravity of a seat or seat component with all cushions and upholstery in place and with the head restraint in its fully extended design position.

35 F.R. 15290
October 1, 1970

Effective: January 1, 1972
August 15, 1973
August 15, 1975
August 15, 1977

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks, and Buses

(Docket No. 69–7; Notice No. 9)

The purpose of this amendment to Standard No. 208, 49 CFR 571.21, is to specify occupant crash protection requirements for passenger cars, multipurpose passenger vheicles, trucks, and buses manufactured on or after January 1, 1972, with additional requirements coming into effect for certain of those vehicles on August 15, 1973, August 15, 1975, and August 15, 1977. The requirements effective for the period beginning on January 1, 1972, were the subject of a notice of proposed rulemaking published September 25, 1970 (35 F.R. 14941), and appear today for the first time in the form of a rule. The requirements for subsequent periods were issued in rule form on November 3, 1970 (35 F.R. 16927), and are reissued today in amended form as the result of petitions for reconsideration.

The substantive rulemaking actions that preceded this amendment are as follows:

(a) May 7, 1970 (35 F.R. 7187)—Proposed requirements and a schedule for the adoption of passive restraint systems and interim active systems.

(b) September 25, 1970 (35 F.R. 14941)—Proposal for a modified interim set of requirements effective January 1, 1972.

(c) November 3, 1970 (35 F.R. 16927)—Rule amending Standard No. 208 to specify requirements for passive restraints, effective July 1, 1973.

(d) November 3, 1970 (35 F.R. 16937)—Proposed additional requirements and conditions to be contained in Standard No. 208.

Following issuance of the November 3 amendment, petitions for reconsideration were filed pursuant to § 553.35 of the procedural rules (49 CFR 553.35, 35 F.R. 5119) by Japan Automobile Manufacturers Association, Inc., American Safety Belt Council, Peugeot, Inc., American Motors Corp., Volvo, Inc., Ford Motor Co., Chrysler, Chrysler United Kingdom, Ltd., International Harvester Co., Automobile Manufacturers Association, General Motors Corp., Volkswagen of America, Inc., Takata Kojyo Co., Ltd., Renault, Inc., American Motors (Jeep), Rolls-Royce, Ltd., American Safety Equipment Corp., Hamill Manufacturing Co., Energy Systems Division (Olin), American Association for Automotive Medicine, Checker Motors Corp., Eaton Yale and Towne, Inc., and the American Academy of Pediatrics.

Concurrently with the evaluation of the petitions, the Administration has reviewed the comments received in response to the September 25 and November 3 proposals, and the interim occupant protection requirements are combined herein with the requirements for later periods.

The standard establishes quantitative criteria for occupant injury, as determined by use of anthropomorphic test devices. For the head, the criterion is a severity index of 1,000, calculated according to SAE Information Report J885a; for the upper thorax, it is a deceleration of 60g except for a cumulative period of not more than 3 milliseconds; and for the upper legs it is an axial force of 1,400 pounds. A fourth criterion is that the test devices must be contained by the outer surfaces of the passenger compartment.

For systems that provide complete passive protection there are three vehicle impact modes in which a vehicle is required to meet the injury criteria. In the frontal mode, the vehicle impacts a fixed collision barrier perpendicularly or at any angle up to and including 30° in either direction from the perpendicular while traveling longitudinally forward at any speed up to 30 m.p.h. In the lateral mode, the vehicle is impacted on its side by a barrier moving at 20 m.p.h. In the rollover mode, the vehicle is rolled over from a speed of 30 m.p.h.

On January 1, 1972, a passenger car will be required to provide one of three options for occupant protection: (1) Passive protection system that meets the above injury criteria in all impact modes at all seating positions; (2) lap belts at all positions, with a requirement that the front outboard positions meet the injury criteria with lap-belted dummies in a 30-m.p.h. perpendicular barrier crash; or (3) lap-and-shoulder-belt systems at the front outboard positions that restrain test dummies in a 30-m.p.h. barrier crash without belt or anchorage failure, and lap belts in other positions.

Both the second and third options require warning systems that activate a visible and audible signal if an occupant of either front outboard position has not extended his lap belt to a specified length. Lap belts furnished under the second or third options must have emergency-locking or automatic-locking retractors at all outboard positions, front and rear. Shoulder belts furnished under the third option must have either manual adjustment or emergency-locking retractors.

On August 15, 1973, a passenger car will be required to provide one of two options for occupant protection: (1) Passive protection that meets the injury criteria in all impact modes at all seating positions; or (2) a system that provides passive protection for the front positions in a perpendicular frontal fixed barrier crash, that includes lap belts at all seating positions such that the injury criteria are met at the front positions both with and without lap belts fastened in a perpendicular frontal fixed barrier crash, and that has a seat belt warning system at the front outboard positions.

On and after August 15, 1975, a passenger car will be required to meet the injury criteria in all impact modes at all seating positions by passive means.

Multipurpose passenger vehicles and trucks with gross vehicle weight ratings of 10,000 pounds or less manufactured from January 1, 1972, to August 15, 1975, will have the option of meeting the injury criteria in all impact modes at all seating positions by passive means, or of providing a seatbelt assembly at each designated seating position. From August 15, 1975, to August 15, 1977, these vehicles will be required to meet one of the two options permitted passenger cars during the period August 15, 1973, to August 15, 1975. On and after August 15, 1977, they will be required to meet the full passive crash protection requirements that become effective for passenger cars on August 15, 1975. Forward control vehicles, however, may continue to use belt systems, and certain other specialized types of vehicles may continue to provide only head-on passive protection.

Multipurpose passenger vehicles and trucks with a GVWR of more than 10,000 pounds manufactured on or after January 1, 1972, will have the option of providing protection by passive means that meet all the crash protection requirements or of installing seat belt assemblies at all seating positions. Buses manufactured after January 1, 1972, will be required to provide one of these options for the driver's seating position.

The remainder of this preamble is separated into sections dealing with (I) the comments received in response to the September 25 proposal for the interim system, (II) the petitions for reconsideration of the November 3 rule on the requirements for later periods, and (III) the comments received and action taken pursuant to the November 3 proposal for additional requirements.

I. The September 25 proposal specified a series of options for occupant protection in passenger cars manufactured on or after January 1, 1972. Each option represented a significant advance over the level of protection afforded occupants by present seat belt systems. Upon consideration of comments requesting postponement of the requirements, it has been determined that compliance with one or another of the options by January 1, 1972, is reasonable and practicable. In response to the comments and other available information, however, certain changes have been made.

In the proposal, the first option consisted of a passive protection system that would meet the injury criteria at all seating positions in a 30 m.p.h. perpendicular frontal impact. A large number of respondents (to this notice and to others dealt with herein), both within and outside of the concerned industries, took the position that the requirements for installation of seat belts should not be dropped until the vehicles in question provided protection in angular, lateral, and rollover crash modes, in addition to the direct frontal mode. After detailed consideration of these arguments and other available data, it has been determined that the added cost of seatbelt systems is justified, even where vehicles provide passive frontal-impact protection. Accordingly, the first option, the only one under which manufacturers are allowed not to provide seat belts in their vehicles, requires a passive protection system that meets the injury criteria in all of the impact modes mentioned above.

The second option set forth in the proposal consisted of Type 1 seatbelt assemblies with a warning system at the front outboard positions and Type 1 or Type 2 assemblies at the other positions. The front outboard positions were either to meet the injury criteria in a perpendicular impact by use of the belts, or be protected by energy absorbing materials conforming to amended requirements proposed for Standards No. 201 and 203. The latter alternative was the subject of several adverse comments, and in the light of these comments and the tentative nature of the proposed amendments to Standards No. 201 and 203, the alternative has been deleted. As adopted, the option provides that the front outboard positions must meet the injury criteria in a perpendicular fixed barrier crash with the test dummies restrained by Type 1 belts only. The wording that a vehicle should have "either a Type 1 or a Type 2" seatbelt assembly under this option has been changed to refer simply to Type 1 (lap belt) assemblies. A manufacturer may at his option provide upper torso restraints, which do or do not attach to the lap belts. The essence of the second option, however, is that the vehicle be designed to provide protection with lap belts alone, in view of their much higher level of public use in comparison with lap-and-shoulder combinations. Vehicles under this option, therefore, must provide lap belts that are usable separately.

The third option proposed in the September 25 notice has been adopted with some changes. It consists of an improved combination of lap and shoulder belts in the front outboard seating positions, with lap belts in other positions. The belts and anchorages at the front outboard positions must be capable of restraining a dummy in a 30-m.p.h. frontal perpendicular impact without separtion of the belts or their anchorages.

The seatbelt warning system required under the second and third options has been modified somewhat in the light of the comments, to clarify the requirements and to restrict its operation to situations where the vehicle is likely to be in motion. The notice proposed that the system operate when the driver or right front passenger, or both, occupied the seat but did not fasten the belt about them. It was stated in several comments such systems operating through the buckle are relatively complex and that leadtime would be a significant problem. Upon evaluation of the comments, it has been decided to provide for warning system operation when the driver's belt is not extended to a length that will accommodate a 5th-percentile adult female, or when the right front passenger's seat is occupied and that belt is not extended far enough to fit a 50th-percentile 6-year-old. Keying the system to belt withdrawal is technologically simpler, and still provides protection against tampering. The notice had proposed that the system operate whenever the vehicle's ignition was in the "on" position. It was pointed out in the comments that situations arise in which the vehicle is at rest with the ignition on and the engine running, as when picking up or discharging passengers. To avoid the annoyance to vehicle occupants of the warning system in such situations, the standard provides that the system shall operate only if the ignition is in the "on" position and the transmission is in a drive position.

The seat belt system requirements have also been changed somewhat in response to comments. The notice had proposed to require retractors at all seating positions in those options specifying seat belts. Several comments stated tha the installation of retractors at inboard positions would require extensive redesign of bench-type seats. In the light of the low occupancy rate for the center seats, the difficulties in meeting the requirement, and the short leadtime available, the requirement for center-position retractors has been omitted.

The requirement that the shoulder and pelvic restraints be releasable at a single point by a pushbutton-type action has been retained. The Administration considers that single-point release is essential to the convenient operation of the seat belts, and that standardization of the buckle release device is also important, particularly in emergency situations. However, the additional requirement for one-hand fastening by the driver has been deleted. Adjustable bench seats would require major redesign in many cases, and it has been determined that the additional convenience afforded the driver would not be sufficient to justify the cost and leadtime problems that would result.

A number of comments noted that no dimensions were specified in the notice for the various occupants, and that there were no dimensions of this type in general use. To remedy the problem, the standard provides a table of dimensions for various sizes of adult occupants and 50th-percentile 6-year-olds. The latter set of dimensions has been adopted because of the availability of manikins at that size.

In response to several comments stating that the proposed 8-inch distance between the occupant's centerline and the intersection of the upper torso belt with the lap belt was too great, the distance has been reduced to 6 inches. It has been determined that a 6-inch distance will provide satisfactory protection and lessen the convenience problems that might be created with the greater distance.

II. With few exceptions, the petitions for reconsideration of the November 3 amendment requested that the requirement for mandatory passive protection be postponed. The length of postponement requested varied from 2 months to several years. After full consideration of the issues raised by the petitions, it has been decided to continue to require passive protection for the front seating positions of passenger cars in 1973. In order to ease the problem of model year scheduling, the date is changed from July 1, 1973, to August 15, 1973. The petitions did not offer sufficient reasons to change the Administration's position as set forth in previous notices in this docket, that passive protection systems are a vitally important step in reducing the death and injury toll on our highways, and that the relevant technology is sufficiently advanced to provide this basic protection, in accordance with the performance requirements and the time schedule that have been specified. The petitions that requested a postponement of all passive protection requirements beyond August 15, 1973, are therefore denied.

However, considerable data was presented in the petitions to the effect that the development of passive systems for the various impact modes has not proceeded at an equal rate. It appears that a number of manufacturers may be unable to comply with the lateral crash protection requirements in 1973. Accordingly, it has been decided to establish two restraint options for the front seating positions of passenger cars manufactured on or after August 15, 1973, and before August 15, 1975. A manufacturer may choose, first, to provide a passive system that meets the occupant crash protection requirements at all seating positions, in all impact modes. If he is unable to provide such full passive protection, he may choose to adopt a system that provides passive protection for the front occupants in a head-on collision, and also, includes a lap belt at each seating position with a seatbelt warning system for the front outboard positions. Under this option, the injury criteria must be met at each front position in a perpendicular barrier crash up to 30 m.p.h., both with and without the lap belts fastened. This option thus resembles the second option permitted during the interim period, except that the injury criteria must also be met with the test dummies unrestrained, and at the front center position as well as the front outboard positions.

The date on which a passenger car must provide passive means of meeting the injury criteria in a side impact is changed to August 15, 1975, to reflect the greater leadtime needed to develop such passive systems. To provide uniform phasing, and allow time for development of passive protection in the angular-impact and rollover modes, the effective date for these requirements is also set at August 15, 1975. Thus, after August 15, 1975, each passenger car must meet the crash protection requirements at each seating position in all impact modes by means that require no action by vehicle occupants.

Petitions of manufacturers of multipurpose passenger vehicles and trucks with GVWR of 10,000 pounds or less stated that the trucking industry as a whole would need additional time to assimilate the experience of passenger car manufacturers, before passive systems could be properly installed on their vehicles. The Administration has determined that additional leadtime is required for these vehicles. The standard accordingly provides that the protection required for passenger cars in 1973 will be required for multipurpose passenger vehicles and trucks with a GVWR of 10,000 pounds or less on August 15, 1975. The protection required for passenger cars on August 15, 1975, will be required of these vehicles on August 15, 1977.

The notice of proposed rulemaking published on November 3, 1970, proposed to make the passive protection requirements applicable to open-body type vehicles. Review of the comments and the petitions for reconsideration leads to the conclusion that this type of vehicle, along with convertibles, walk-in van-type vehicles, motor homes, and chassis-mount campers cannot be satisfactorily equipped with a complete passive protection system. Accordingly, the standard provides that only the head-on passive protection system required for passenger cars in 1973 will be required for each of these types on August 15, 1977, and thereafter. It has been further determined that it may not be feasible to provide passive protection in some forward control vehicles, and such vehicles are therefore permitted the option of providing seat belt assemblies at all seating positions.

A number of petitions objected to the requirement for a minimum speed below which a crash-deployed system may not deploy. Upon consideration of the petitions, it has been determined that it is preferable to allow manufacturers freedom in the design of their protective systems at all speeds, and this requirement is hereby deleted from the standard.

The injury criteria specified in the November 3 amendment were the subject of numerous petitions. The basic objections to the head injury criteria were that the 70g–3-millisecond requirement was too conservative, with respect to both acceleration levels and time factors. Review of these objections and a reevaluation of the information available to the Administration leads to the conclusion that the head injury criteria can be more appropriately based on the severity index described in the Society of Automotive Engineers Information Report J885(a), June 1966. Accordingly, the standard adopts as the criterion for head injury a severity index of 1,000 calculated by the method in the SAE report.

The severity index is based on biomechanical data derived from head injury studies and does not adapt itself readily to chest-injury usage. Several petitions stated that the chest injury criteria were set at too low a level. In some respects, a higher "g-level" on the chest actually increases the protective capabilities of the system, if properly designed, since it more effectively utilizes the available space in which the occupant can "ride down" the crash impact—an especially important factor in higher-speed crashes. Therefore, in accordance with data currently available, a chest tolerance level of 60g, except for a cumulative period of 3 milliseconds, is hereby adopted.

No data was received to support the contention of several petitioners that the upper leg load was too conservative. The maximum force level of 1,400 pounds appears well founded and is retained.

Several petitions objected to the condition that vehicles be tested at their gross vehicle weight rating. Under review of the appropriateness of this requirement for passenger cars and a review of loading patterns on trucks, it has been decided to alter the condition to specify that passenger cars are tested at a weight that represents their unloaded vehicle weight (recently defined in the *Federal Register* of Feb. 5, 1971, 36 F.R. 2511) plus the weight of rated cargo capacity and the specified number of test devices. Trucks are to be tested at a weight that approximates a half-loaded vehicle, with the load secured in the cargo area, plus the specified number of test devices.

The use of the anthropomorphic test device described in SAE J963 was objected to by several petitioners, on the grounds that further specifications are needed to ensure repeatability of test results. The Administration finds no sufficient reason to alter its conclusion that the SAE specification is the best available. The NHTSA is sponsoring further research and examining all available data, however, with a view to issuance of further specifications for these devices.

In response to other comments with respect to test conditions, the test devices' hand positions are adjusted to reduce apparent test variability. Also, the frequency filtration criteria of SAE Recommended Practice J211 have been substituted for the filtration criteria employed in the November 3 notice.

III. The notice of proposed rulemaking issued on November 3, 1970, dealt with several aspects of the occupant protection standard for which changes contemplated by the Administration, after review of the comments to the May 7 notice, were thought to require additional opportunity for comment. These aspects included a proposed deletion of the exemption from the rollover requirements previously proposed for open-body type vehicles, the raising of the low-velocity deployment requirement from 10 to 15 m.p.h., the establishment of requirements for the lateral component of head and chest acceleration, and the amendment of the test conditions for the lateral impact and rollover requirements.

Since the subject of low speed deployment and the question of exemptions were also the subjects of petitions for reconsideration under the November 3 rule, the disposition of these matters has been noted in the preceding section. For the reasons given therein, the low-velocity deployment requirement has been omitted, and the exemptions have been expanded to include forward control vehicles, convertibles, walk-in van-type trucks, motor homes, and chassis-mount campers. These type descriptions are in general use among manufacturers to describe vehicles sharing certain well-defined characteristics. Definitions of these types of vehicles may, as found necessary in the future, be added to § 571.3 *Definitions*.

Upon review of the comments and other information available to the Administration, it has been decided that the establishment of requirements for the lateral component of head and chest acceleration is not feasible at this time. However, it is anticipated that biomechanical studies will shortly provide data regarding lateral tolerances on which a requirement can be based and that rulemaking action will thereupon resume.

The conditions proposed for the lateral impact and rollover tests have been adopted as proposed without significant change. Comments on the lateral impact test revealed no significant support for a fixed barrier collision of the type proposed in the May 7 notice, although several recommended use of the moving barrier specified in SAE Recommended Practice J972 and others requested that the height of the barrier be lowered from 65 inches to 36–38 inches as specified in SAE J972. The decision to retain the test and barrier dimensions as proposed in the November 3 notice was made after a full review of the SAE procedures.

The test as adopted is considered to afford greater repeatability than the SAE procedure, which permits a much more complex interaction between the barrier and the impacted vehicle. The height of the barrier has been retained at 65 inches so that it will test the head impact protection afforded by the vehicle when struck by a surface extending to head height. Passenger compartment intrusion of the type that might result from use of a lower barrier is the subject of a separate rulemaking action on side door strength.

Some comments suggested that the wording of the proposed procedures, that the moving barrier undergo no deformation or nonlongitudinal movement, was unduly restrictive. The wording is not, however, intended to describe an actual test, but to establish the condition that the vehicle must be capable of meeting the stated requirements no matter how small the degree of deformation or nonlongitudinal movement of the barrier. This issue, in the case of the moving barrier, is thus analogous to that in the definition of "fixed collision barrier" (35 F.R. 11242, July 14, 1970). To more clearly reflect this position and the legal similarity of the two types of barriers, the word "significant" is added to the conditions relating to movement and deformation of the barrier.

Several comments stated that the rollover test would not produce repeatable results. Although refinements may be made in the procedure before the date on which rollover protection becomes mandatory, the Administration has determined that the test as adopted is more satisfactory than any other suggested thus far. The kinematics of a rollover type accident are such that variability in vehicle behavior may often be more visible than in other test procedures.

A number of other minor issues were raised by the petitions, and each has been carefully evaluated by the Administration. With respect to those objections and suggestions not specifically mentioned elsewhere in this notice, the petitions are hereby denied.

In light of the foregoing, Motor Vehicle Safety Standard No. 208 in § 571.21 of Title 49, Code of Federal Regulations, is amended . . . with effective dates as specified in the text of the standard.

Issued on March 3, 1971.

Douglas W. Toms,
Acting Administrator.

36 F.R. 4600
March 10, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 10)

The purpose of this notice is to respond to petitions for reconsideration of Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, in § 571.21 of Title 49, Code of Federal Regulations. The petitions addressed herein are those dealing with seat belts and seat belt warning systems. A notice responding to petitions concerning the passive protection aspects of the standard will be issued shortly and the standard republished in its entirety at that time.

The standard as issued March 3, 1971 (36 F.R. 4600), established January 1, 1972, as the first date in the progressive stages of the Occupant Crash Protection requirements. Two petitioners, Mercedes–Benz and American Motors, requested a delay in the introduction of the interim protection systems. American Motors requested a delay until April 1, 1972, to allow for adequate compliance testing, and Mercedes requested a date of July 1, 1972, to avoid disruption of the 1972 model production which begins on July 1, 1971. Upon review of all available information, the NHTSA has concluded that the date is not unreasonably demanding, and the requests are denied.

The improved seat belt systems required in passenger cars that do not provide full passive protection were the subject of several petitions. Primary attention was directed to the belt warning system and the conditions under which it must operate. As issued on March 3, the standard provides that the system shall operate when and only when the ignition is on, the transmission is in any forward or reverse position, and either the driver's lap belt is not extended at least to the degree necessary to fit a 5th-percentile adult female or a person of at least the weight of a 50th-percentile 6-year old is seated in the right front position and the belt is not extended to the length necessary to fit him.

The intent of the transmission position requirement was to require operation of the warning system when the vehicle was likely to be in motion, and the effect of the "when and only when" phrase was to require deactivation in all other positions. Some petitioners argued that rearward motion was not likely to be fast enough to present a hazard. Others stated, on the other hand, that vehicles with automatic transmissions should deactivate the system only in "Park", to encourage drivers to use that position when leaving the vehicle with the engine running. Similarly, it was requested that alternative means of warning system deactivation be permitted on cars with manual transmissions, with one alternative being application of the parking brake. The NHTSA has found these arguments to have merit, and therefore amends S7.3 of the standard in several respects. The amended section requires, as the first condition necessary to activate the warning, that the ignition be "on" and that the transmission be in a forward gear. Actuation is permitted in reverse, but is no longer required. The section is further amended to require that the system on a car with automatic transmissions shall not activate when the transmission is in "park" and that the system on a car with manual transmission shall not activate when the parking brake is on or, alternatively, when the transmission is in neutral.

Several petitions stated that although the length necessary to fit a 50th-percentile 6-year old or a 5th-percentile adult female may be objectively determinable, the sensor in a system may not exactly measure this length due to unavoidable variances in production. To allow for this variance, a manufacturer must calibrate the retractors so that the range of this variance will be beyond the minimum length, and as a result it is likely that the warning will continue to operate in some situations where a small occupant has properly fastened the belt. A similar objection was raised by Mercedes-Benz and illustrated by the case of a small child whose bouncing could cause the belt to retract far enough to trigger the warning intermittently. These objections are considered to have merit, and the NHTSA has therefore decided to specify a range of extensions below which the system must activate and above which it must not activate. The lower end of the range is an extension of 4 inches from the normally stowed position, and the upper end is the extension necessary to fit a 50th-percentile 6-year-old child when the seat is in the rearmost and lowest position. This range will allow manufacturers a tolerance of several inches in most cases and will enable them to avoid the problems of inadvertent activation.

Mercedes-Benz requested that the warning be deactivated by closing the buckle and stated that this would be simpler and more effective than deactivation by belt extension. Although Mercedes' objections are partially met by the amendments made by this notice to the warning system requirements, a related consequence of the amendments is that the extension needed to close the buckle would fall within the range of discretionary deactivation. There does not appear to be good reason to prohibit deactivation by means of the buckle, and the standard is therefore amended to permit buckle deactivation as an alternative to deactivation by measurement of the belt extension.

General Motors requested a minimum duration for the warning signal beyond which it would not be required to operate. On review, this request appears to satisfy the need for warning and to reduce the annoyance of the signal in situations where unfastening of the belt is necessary. A minimum activation period of one minute is therefore provided.

One other request for amendment of the warning system requirements has been found meritorious. American Motors requested that the words "Fasten Belts" be permitted as an alternative to "Fasten Seat Belts." The change would not affect the sense of the message, and the request is granted. Requests in other petitions for the use of symbols in place of words, and for a two-stage warning sequence, have been evaluated and rejected.

In its petition, Chrysler requested the adoption of size specifications for the buttocks of a dummy representing a 6-year-old child, on the grounds that currently available dummies do not correspond to human shape and do not activate the Chrysler warning system as a child would. The problem is not considered serious enough to warrant amendment of the standard in the absence of satisfactory data on the shape of 6-year-old children, and the request is denied.

A number of petitions dealt with other aspects of the seat belt options. The requirement for retractors at all outboard seating positions, including the third seats in station wagons, was objected to by Ford and Chrysler because of installation difficulties and the low frequency of seat occupancy. The similarity of these seating positions to the center positions, which are exempt from the reactor requirements, has been found persuasive and retractors are therefore required only for outboard positions on the first and second seats.

Another petition requested that the shoulder belt of Type 2 assemblies should not adjust to fit 50th-percentile 6-year olds, as presently required for passenger seats by S7.1.1. As pointed out in the petition, the previous rule had specified the 5th-percentile adult female as the lower end of the range for shoulder belts. The change effected by the March 3 rule was inadvertent, and the range of occupants is therefore specified as being from the 5th-percentile adult female to the 95th-percentile male.

Correspondence from Toyo Kogyo requesting an interpretation of S7.1.2 has pointed out a need to clarify the requirement that the intersection of an upper torso belt with a lap belt must be six inches from the occupant's centerline. The phrase "adjusted in accordance with the manufacturer's instructions" is intended to refer to adjustment of the upper torso belt, and not to the lap belt which must adjust automatically. The section is amended to clarify this intent.

The second options under the 1972 and 1973 requirements (S4.1.1.2, S4.1.2.2) are amended to expressly permit a Type 2 seat belt assembly with a detachable upper torso restraint at any seating position. A choice of belt systems is permitted under the third option in 1972, and there was no intent under the second options to limit all positions to Type 1 belts.

Several requests and questions were raised regarding the status of "passive" seat belt systems under the standard as issued March 3. Some belt-based concepts have been advanced that appear to be capable of meeting the complete passive protection options and further regulation of their performance does not appear necessary. With respect to the options other than the complete passive protection options, a question has been raised as to whether a passive belt must be used in conjunction with active belt systems or conform to the adjustment, latching, and warning system requirements applicable to active belts. Upon review, the NHTSA has concluded that the passive belt system that is not capable of full protection in all crash modes is in some respects appropriately regulated by seat belt requirements, and is in other respects entitled to treatment as a passive system.

To deal expressly with passive belts, a new general requirements section is added to state the applicability of various requirements to passive belts and to make it clear that redundant active belts need not be employed if passive belts are used to meet any option requiring Type 1 or Type 2 belts.

Many of the requirements applicable to belts have been adopted because of properties that exist regardless of whether the system is active or passive. The range of the belt's adjustment, the elasticity and width of its webbing, and the integrity of its attachment hardware are all known to affect the protection given. As amended, the standard therefore requires a passive belt to conform to the adjustment requirements of S7.1 and to the webbing, attachment hardware, and assembly performance requirement of Standard No. 209. The petitioners' objections as to the application of the latching requirements to a system that does not require latching and of the warning system requirements to a system that would be functional unless willfuly defeated have been found to have merit. A passive belt system is therefore not required to conform to S7.2 and S7.3.

In order to assure that a passive belt or other passive system will not hinder an occupant from leaving the vehicle after a crash, the NHTSA proposes in a separate notice in today's issue of the *Federal Register* (36 F.R. 12866) to require a release for the occupant that either operates automatically in the event of a crash, or operates manually at a single point that is accessible to the seated occupant.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, in § 571.21 of Title 49, Code of Federal Regulations, is amended. . . . Effective date: January 1, 1972.

Issued on July 2, 1971.

Douglas W. Toms
Acting Administrator

36 F.R. 12858
July 8, 1971

Preamble to Amendment to Motor Vehicle Safety Standard No. 208

Occupant Crash Protection

(Docket No. 69-7; Notice 12)

The purpose of this notice is to respond to petitions filed pursuant to § 553.35 of Title 49, Code of Federal Regulations, requesting reconsideration of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.21, published on March 10, 1971 (36 F.R. 4600).

The petitions covered by this notice deal with the passive restraint requirements, and with the restraint options available after August 15, 1973. Petitions relating to seat belts and seat belt warning systems were answered in a notice published in the *Federal Register* on July 8, 1971 (36 F.R. 12858). Each request contained in the petitions has been evaluated. Particular requests relative to the March 10, 1971, rule not expressly mentioned in this notice or in the notice of July 8 have been denied.

To avoid possible confusion as to the number of test devices to be used in a test, the NHTSA is amending S5.1 at the request of American Motors and General Motors to indicate more clearly that test devices are to be placed at all seating positions unless a lesser number is prescribed in S4.

Several petitioners sought amendment of the readiness indicator requirement in S4.5.2 to limit the components of a deployable system that must be monitored. In particular, it was stated that the integrity of a pressure vessel could be diminished by a pressure gauge, and that the reliability of electrically activated explosive release devices would be impaired if the activating wire had to be monitored. To permit manufacturers to avoid designs that are prone to deterioration, the requirement has been amended by omitting specific reference to compressed gases and electrical circuits.

Several petitions requested changes with respect to the weight at which a multipurpose passenger vehicle, truck, or bus is to be tested. It was stated that the half-loaded weight specified in the standard was unrepresentative of the weights of vehicles involved in crashes, and that it placed an unreasonably severe strain on the vehicle. On consideration of the data and arguments presented, it has been determined that a reduction in the loading of these vehicles is appropriate. The required vehicle weight is accordingly reduced to 300 pounds plus the weight of the necessary anthropomorphic test devices. It should be noted that instrumentation is to be included as part of the 300 pounds.

With regard to the placement of test devices in the vehicle, it was pointed out that the specified position of the driver's right foot often produced an unnaturally awkward result and that the positioning might be achieved in some cases only by sacrificing some portion of underdash padding. In response to these points, the positioning requirement is amended to permit more natural placement, with the foot in contact with the undepressed accelerator pedal.

The petitions included several objections to the requirements for rollover testing. It was argued that the test did not produce repeatable results with respect to vehicle behavior. The NHTSA has given serious consideration to these arguments, and has conducted a series of vehicle tests according to the procedures of the standard. These tests have demonstrated a high degree of repeatability in vehicle behavior. Occupant ejection in rollover accidents, and the retention of occupants in rollovers is a major element in effective crash protection. The petitions to delete the rollover test from the standard are therefore denied.

Some petitions objected to the requirement for barrier tests at "any angle up to 30° in either direction from the perpendicular." The NHTSA is aware that such an all-angles test may be more demanding than a test that arbitrarily selects two angles, such as 15° and 30°. Manufacturers are free, however, to limit their testing to the "worst case." Since accidents occur at all angles, it is considered important that vehicles be capable of meeting the protection requirements at any angle within the prescribed limits.

The lateral moving barrier test was also objected to by several petitioners, particularly by manufacturers of smaller vehicles who consider the 4,000-pound weight of the barrier to be excessive. The lateral moving barrier test is included in the standard because of the disproportionately high number of serious injuries suffered in side impacts. The weight of the barrier was chosen to represent the average weight of domestic passenger cars, the vehicles most likely to strike the side of a vehicle, regardless of the impacted vehicle's size. The requirement is retained.

The use of the Severity Index of 1000 as the criterion for head injury was objected to as too stringent, and a more lenient index requested. Considering the present state of the art in head injury measurement, it has been determined that a Severity Index of 1000 is the most acceptable criterion at this time, and it has therefore been retained. In a related objection, Chrysler stated that the 1000-Hz channel class requirement for accelerometers in the head was too high. In the judgment of the NHTSA, however, the 1000-Hz channel class specification as incorporated in SAE J211 represents an acceptable level of instrument sensitivity. The requirement has therefore been retained.

In the context of the petitions regarding the rollover requirements, it was suggested that the requirement of S6.1 that all portions of the test device be contained within the passenger compartment during the test was unnecessarily stringent. In retaining this requirement the NHTSA intends to require a substantial degree of passenger compartment integrity in all types of accidents. The test condition that specifies windows to be in the up position is retained to restrict random excursions of test devices, and to provide for consistency in the evaluation of test results.

General Motors noted in its petition that there are a large number of State and local laws concerning the shipment, storage and use of pressurized cylinders and explosive devices that might be used in air bag systems. Many of these laws are at variance with the regulations of the Department of Transportation's Hazardous Materials Regulations Board governing these materials (found in Chapter 1, Subtitle B, of Title 49, Code of Federal Regulations). If these State and local laws were to be applied to equipment that is part of a large proportion of the new passenger cars in this country, the distribution, sale, use, and maintenance of those vehicles could be seriously hindered. General Motors suggested that the Federal regulations governing these materials be incorporated into the requirements of Standard No. 208, thus preempting all State and local requirements (i.e., requiring them to be identical) under section 103(d) of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392(d). The NHTSA recognizes this problem, and is considering various methods of solving it, in consultation with other concerned agencies. No regulatory action to that end is taken in this notice, but some such action is anticipated in the near future.

Several petitioners noted that the requirements for anthropomorphic test devices specified in the standard, mainly those set forth in SAE Recommended Practice J963, do not completely define all the characteristics of the dummies that may be relevant to their (and the vehicle's) performance in a crash test. The NHTSA considers the comment valid. It would actually be difficult, if not impossible, to describe the test dummy in performance terms with such specificity that every dummy that could be built to the specifications would perform identically under similar conditions. Of course, since the dummy is merely a test instrument and not an item of regulated equipment, it is not necessary to describe it in performance terms; its design could legally be "frozen" by detailed, blueprint-type drawings and complete equipment specifications. Such an action does not, however, appear to be desirable at this time. Considerable development work is in process under various auspices to refine the dynamic characteristics of anthropomorphic devices, to determine which designs are most practicable, offer the most useful results, and best simulate the critical characteristics of the human body. The NHTSA is monitoring this work (and sponsoring some of it), and intends to propose amendments of the standard in accordance with it to add more detailed performance and descriptive specifications for the test dummies, although no changes are being made in that respect by this notice.

In the meantime, it should be understood that the NHTSA does not intend that a manufacturer's status with respect to compliance will be jeopardized by possible variances in test dummies permitted by the present set of specifications. In the agency's judgment, a test dummy that conforms to the specifications incorporated by the standard is an adequate test tool for determining the basic safety characteristics of a vehicle. If the NHTSA concludes after investigation that a manufacturer's tests are properly conducted, with dummies meeting the specifications, and show compliance with the standard, and that differences in results from tests conducted by the agency are due to differences in the test dummies used by each, the agency tests will not be considered to be the basis for a finding of noncompliance.

A number of the petitioners sought a delay in the effective dates of the standard, particularly the August 15, 1973, date which passenger cars are required to provide at least head-on protection for front-seat occupants by means that require no occupant action. Several vehicle manufacturers argued that further time is needed to prepare for the introduction of passive restraint systems in all passenger car lines. They pointed out that much of their effort during the past year has been spent refining and testing the design of these systems in order to ensure satisfactory performance under the most adverse conditions that may be encountered by vehicles in use. Mandatory introduction of passive restraints in all passenger cars by the August 15, 1973, date, it was argued, would impose severe financial hardships, because of the difficulties that would be encountered in obtaining tools, setting up production lines, and working out the inevitable production and quality-control problems for all their vehicles simultaneously, contrary to the normal practice in the industry.

It has been determined that these petitions have some merit. Materials submitted to the docket concerning the state of passive restraint development indicate that systems now available will meet the requirements of Standard 208 for passive frontal crash protection, and perform satisfactorily in other respects. It does not now appear, however, that tooling and production leadtimes will permit manufacturers to make large-scale introductions of passive systems before the fall of 1973. This agency is aware of the extreme dislocations, and the attendant financial hardships, that would be caused by requiring the world industry (to the extent of the vehicles sold in this country) to introduce major new systems in substantially all their passenger cars at the same time.

For these reasons, it has been determined that manufacturers should be allowed additional time to introduce passive protection systems. To that end, a notice of proposed rulemaking is published in this issue of the *Federal Register* that would allow manufacturers of passenger cars the option of installing seat belt systems with ignition interlocks for the period up to August 15, 1975. It is expected that this added leadtime will enable manufacturers to institute an orderly, phased introduction of passive systems into their vehicles, installing such systems in their various car lines, to the extent feasible, in advance of that date.

The July 8 notice indicated that the standard would be republished in its entirety upon publication of today's action. This has not been done, because of the limited number of amendments made by this notice.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, in § 571.21 of Title 49, Code of Federal Regulations is amended . . . .

Effective dates: January 1, 1972, with additional requirements effective at later dates, as indicated in the text of the rule published March 10, 1971 (36 F.R. 4600).

(Secs. 103, 108, 112, 114, 119, National Traffic and Motor Vehicle Safety Act, U.S.C. 1392, 1397, 1401, 1403, 1407, delegation of authority at 49 CFR 1.51)

Issued on September 29, 1971.

Douglas W. Toms
Administrator

36 F.R. 19254
October 1, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Seat Belt Installations

(Docket No. 2–6; Notice 5)

The purpose of this amendment to Part 571 of Title 49, Code of Federal Regulations, is to add a new Motor Vehicle Safety Standard 216, (49 CFR § 571.216) that sets minimum strength requirements for a passenger car roof to reduce the likelihood of roof collapse in a rollover accident. The standard provides an alternative to conformity with the rollover test of Standard 208.

A notice of proposed rulemaking on this subject was issued on January 6, 1971 (36 F.R. 166). As noted in that proposal, the strength of a vehicle roof affects the integrity of the passenger compartment and the safety of the occupants. A few comments suggested that there is no significant causal relationship between roof deformation and occupant injuries in rollover accidents. However, available data have shown that for non-ejected front seat occupants in rollover accidents, serious injuries are more frequent when the roof collapses.

The roof crush standard will provide protection in rollover accidents by improving the integrity of the door, side window, and windshield retention areas. Preserving the overall structure of the vehicle in a crash decreases the likelihood of occupant ejection, reduces the hazard of occupant interior impacts, and enhances occupant egress after the accident. It has been determined, therefore, that improved roof strength will increase occupant protection in rollover accidents.

Standard 208 (49 CFR § 571.208), *Occupant Crash Protection*, also contains a rollover test requirement for vehicles that conform to the "first option" of providing complete passive protection. The new Standard 216 issued herewith is intended as an alternative to the Standard 208 rollover test, such that manufacturers may conform to either requirement as they choose. Standard 208 is accordingly amended by this notice; the effect of the amendment, together with the new Standard 216, is as follows:

(1) From January 1, 1972, to August 14, 1973, a manufacturer may substitute Standard 216 for the rollover test requirement in the first option of Standard 208; Standard 216 has no mandatory application.

(2) From August 15, 1973, to August 14, 1977, Standard 216 is in effect as to all passenger cars except those conforming by passive means to the rollover test of Standard 208, but it may continue to be substituted for that rollover test.

(3) After August 15, 1977, Standard 216 will no longer be a substitute for the Standard 208 rollover test. It is expected that as of that date Standard 216 will be revoked, at least with respect to its application to passenger cars.

A few comments stated that on some models the strength required in the A pillar could be produced only by designs that impair forward visibility. After review of strengthening options available to manufacturers, the Administration has concluded that a satisfactory increase in strength can be obtained without reducing visibility.

Some comments suggested that the crush limitation be based on the interior deflection of the test vehicle rather than the proposed external criterion. After comparison of the two methods, it has been concluded that a test based on interior deflection would produce results that are significantly less uniform and more difficult to measure, and therefore the requirement based on external movement of the test block has been retained.

Several changes in detail have been made, however, in the test procedure. A number of comments stated that the surface area of the proposed test device was too small, that the 10-degree pitch angle was too severe, and that the 5 inches of padded test device displacement was not enough to measure the overall roof strength. Later data available after the issuance of the NPRM (Notice 4) substantiated these comments. Accordingly, the dimensions of the test block have been changed from 12 inches square to 30 inches by 72 inches, the face padding on the block has been eliminated, and the pitch angle has been changed from 10 degrees to 5 degrees.

Several manufacturers asked that convertibles be exempted from the standard, stating that it was impracticable for those vehicles to be brought into compliance. The Administration has determined that compliance with the standard would pose extreme difficulties for many convertible models. Accordingly, manufacturers of convertibles need not comply with the standard; however, until August 15, 1977, they may comply with the standard as an alternative to conformity with the rollover test of Standard 208.

A few comments objected to the optional 5,000-pound ceiling to the requirement that the roof have a peak resistance of 1½ times the unloaded vehicle weight. Such objections have some merit, if the energy to be dissipated during a rollover accident must be absorbed entirely by the crash vehicle. In the typical rollover accident, however, in which the vehicle rolls onto the road shoulder, significant amounts of energy are absorbed by the ground. This is particularly true in heavier vehicles. Some of the heavier vehicles, moreover, would require extensive redesign, at a considerably greater cost penalty than in the case of lighter vehicles, to meet a strength requirement of 1½ times their weight. At the same time, heavier vehicles generally have a lower rollover tendency than do lighter vehicles. On the basis of these factors, it has been determined than an upper limit of 5,000 pounds on the strength requirement is justified, and it has been retained.

It was requested that the requirement of mounting the chassis horizontally be deleted. It has been determined that the horizontal mounting position contributes to the repeatability of the test procedure and the requirement is therefore retained.

The required loading rate has been clarified in light of the comments. The requirement has been changed from a rate not to exceed 200 pounds per second to a loading device travel rate not exceeding one-half inch per second, with completion of the test within 120 seconds.

A number of manufacturers requested that repetition of the test on the opposite front corner of the roof be deleted. It has been determined that, as long as it is clear that both the left and right front portions of the vehicle's roof structure must be capable of meeting the requirements, it is not necessary that a given vehicle be capable of sustaining successive force applications at the two different locations. The second test is accordingly deleted.

Effective date: August 15, 1973. After evaluation of the comments and other information, it has been determined that the structural changes required by the standard will be such that many manufacturers would be unable to meet the requirements if the January 1, 1973 effective date were retained. It has therefore been found, for good cause shown, that an effective date more than one year after issuance is in the public interest. On or after January 1, 1972, however, a manufacturer may substitute compliance with this standard for compliance with the rollover test requirement of Standard 208.

In consideration of the above, the following changes are made in Part 571 of Title 49, Code of Federal Regulations:

1. Standard No. 208, 49 CFR § 571.208, is amended by adding the following sentence at the end of S5.3, *Rollover:* "However, vehicles manufactured before August 15, 1977, that conform to the requirements of Standard No. 216 (§ 571.216) need not conform to this rollover test required."

2. A new § 571.216, Standard No. 216, *Roof Crush Resistance*, is added, as set forth below.

This rule is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on December 3, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 23299
December 8, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 15)

The purpose of this notice is to respond to petitions requesting reconsideration of the amendments to the seat belt requirements of Standard No. 208, *Occupant Crash Protection*, issued on July 2, 1971 (36 F.R. 12858, July 8, 1971). The petitions are granted in part and denied in part.

The Chrysler Corporation requested an amendment of the belt warning system requirements in S7.3, to provide that the system shall operate only when the vehicle's engine is running. Section S7.3.1 presently requires the warning to operate whenever the ignition is "on", the transmission is in a forward gear, and seat belts are not in use at occupied front outboard seats. Chrysler stated that basing the warning system operation on engine operation would permit simplification of the warning system circuitry. On review, the NHTSA has concluded that the Chrysler position has merit and that requiring warning system operation only when the engine is operating will satisfactorily include the situations in which the vehicle is likely to be in motion, and thereby satisfy the intent of the warning system requirement. S7.3.1(a) is amended accordingly.

It should be noted that a warning system that operates whenever the ignition switch is "on", in accordance with the prior version of S7.3.1(a), will continue to meet the requirement as amended, since such a system will of necessity operate when the engine is running.

Subsequent to the adoption of the passive seat belt requirement, S4.5.3 (Notice 10, 36 F.R. 12858, July 8, 1971), questions have been raised by Toyota, Renault and Volkswagen as to the configuration required of passive belts used in place of active belts. The NHTSA's intent in adopting S4.5.3 was to permit manufacturers to substitute a Type 2 passive assembly with a detachable or nondetachable shoulder belt for any active seat belt specified under an option of S4, even though the S4 option specifies a Type 1 assembly or a Type 2 assembly with a detachable shoulder belt. The agency also intended to permit the substitution of Type 1 passive assemblies where an option does not require a Type 2 assembly. Thus a passive belt used at the front outboard seating positions to meet the third option in the period beginning January 1, 1972 (S4.1.1.3.1(a)) would have to be a Type 2 assembly. Although no formal petitions have been received on these points, it is considered advisable to amend S4.5.3 to clarify its intent.

The formal petition of JAMA with respect to S4.5.3 requested deletion of the requirement that passive seat belt assemblies must meet the assembly performance and webbing requirements of Standard No. 209. The basis for the request was JAMA's belief that the manufacturer should be allowed as much freedom in the design of a passive belt system to fit the crash characteristics of a particular vehicle as he would have in the design of other types of passive restraints. On reconsideration, the NHTSA has decided that relief from Standard No. 209 should be afforded if a passive belt is capable of meeting the occupant crash protection requirements of S5.1 in a frontal perpendicular impact and amends S4.5.3 accordingly.

The JAMA petition also requested the NHTSA to make it clear that the anchorages of a passive seat belt assembly need not meet the requirements of Standard No. 210. The installation of anchorages is required by Standard No. 210, regardless of the type restraint system in the vehicle. The NHTSA does not consider that a sufficient need has been shown at this time for amendment of

Standard No. 210. Anchorages installed pursuant to that standard are permitted to elongate, so long as they sustain the maximum required force, and such anchorages should therefore be usable in new energy absorbing belt systems.

Ford requested an increase in the minimum warning signal duration from 1 minute to 5 minutes. The NHTSA has considered a variety of alternatives in arriving at the 1-minute level, and remains persuaded that it is a reasonable compromise between the need for warning and the need to avoid undue annoyance in situations where a belt must be temporarily unfastened. The petition is denied.

JAMA requested an amendment to S7.3.3 to provide vehicles with automatic transmissions the option of shutting off the warning signal by use of the parking brake. Although this option is provided for vehicles with manual transmission by S7.3.4 as a concession to cost and leadtime problems of certain manufacturers, there are inconveniences associated with its use on vehicles with automatic transmissions, whose drivers may often prefer to use the "Park" position rather than the parking brake. The petition is therefore denied.

General Motors petitioned for an amendment of S7.3.3 and S7.3.4 to allow warning system activation when the ignition is in the "start" position. The notice issued September 29 proposed amendments to these sections that would require deactivation only when the ignition is in the "on" position. This would permit activation of the system with the ignition in the "start" position, as requested by General Motors. No adverse comment has been received on this proposal, and favorable action will be taken in the rule to be issued pursuant to the notice of September 29.

In another request concerning S7.3.4(b), JAMA suggested an amendment to permit deactivation of the warning system whenever the parking brake lamp is illuminated. The NHTSA considers such a system to be an acceptable means of conforming to S7.3.4(b) under the present language. Since no further amendment is necessary, the petition for amendment is denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, § 571.208 of Title 49, Code of Federal Regulations is amended . . . .

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on December 9, 1971.

Charles H. Hartman
Acting Administrator

36 F.R. 23725
December 14, 1971

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket 69–7; Notice 16)

The purpose of this notice is to amend Standard No. 208, Occupant Crash Protection, as proposed September 29, 1971 (36 F.R. 19266, October 1, 1971) with respect to the occupant protection options available between August 15, 1973 and August 15, 1975. The amendments proposed on September 29 are adopted essentially as proposed, with minor modifications.

The notice proposed a third occupant protection option (S4.1.2.3) for passenger cars manufactured between August 15, 1973 and August 15, 1975. The salient feature of the new option was the use of seat belts equipped with an ignition interlock system that would prevent the engine from starting if any front seat occupant did not have his belt fastened. The belts at the front outboard positions would have to meet the injury criteria of the standard in a 30 m.p.h. frontal barrier crash, and any lap belt in the center position would have to remain intact in the same crash. If shoulder belts were provided at the front positions, they would have to be nondetachable and have emergency locking retractors. Additional features of the interlock system as specified in S7.3.5 included an antidefeat measure that would require the belt to be fastened *after* the occupant is seated, a requirement that unfastening the belt would not stop the engine, and a provision for seat belt warning system operation when the ignition is in the "start" position and a belt is unfastened at an occupied front seat position. With minor exceptions noted in the following discussion, the option is adopted as proposed.

Several comments approved of the interlock option. Mr. Ralph Nader and the Center for Auto Safety raised procedural objections concerning the issue of placing intragovernmental communications in the docket. This issue is presently the subject of litigation in the Federal Courts, and would not be appropriate for discussion herein. The Center also objected that both the interlock option, to begin August 15, 1973, and the passive restraint requirement, beginning August 15, 1975, should be instituted one year earlier. The option that includes the interlock system also requires emergency-locking shoulder belt retractors, however, and the agency has determined that the 1974 model year is the earliest practicable time by which the option can be effectuated. As for the passive restraint requirement to become effective on August 15, 1975, the reasons for setting that effective date were discussed at length in Notice 12 (36 F.R. 19254, October 1, 1971), and need not be restated here.

There were differences of opinion among the comments on the desirability of various other aspects of S4.1.2.3. The requirement of greatest concern appears to be S4.1.2.3(b), which requires the injury criteria to be met at the front outboard positions in a 30-mph frontal barrier crash with the test dummy restrained by the seat belt. It was the intent of the proposal to allow another means of providing the requisite level of occupant protection, not to lower the level of protection. Present information indicates that systems meeting the injury criteria are available using current seat belt technology, and the agency therefore adopts the requirement as proposed.

To allow greater diversity in belt system development, it has been decided to accept the suggestion made in a number of comments that conformity to Standard No. 209 should not be required of belt systems that meet the injury criteria. Accordingly, those options that require a seat belt to meet the injury criteria (S4.1.1.2, S4.1.2.2 and S4.1.2.3) are amended by limiting the application of Standard No. 209 to belts other than those meeting the injury criteria. A belt provided at a center front position is not required to meet the injury criteria and is therefore required to conform to Standard No. 209.

Related requests for exemption from the anchorage requirements of Standard No. 210 have not been adopted in that they appear to be unnecessary. An amendment to permit anchorages that absorb energy by elongating under force is not necessary, since Standard No. 210 expressly permits deformation so long as the maximum force is sustained. In the absence of other data indicating a need to amend Standard No. 210, no change is proposed in that standard.

Chrysler's suggestion that a shoulder belt shaped as an inverted Y could be used in lieu of a nondetachable upper torso belt has not been adopted, primarily because of the likelihood that it would often go unused. There is nothing to prevent a manufacturer from installing such a belt along with the lap belt, so long as the lap belt alone is capable of meeting the injury criteria.

The interlock requirements were the subject of diverse comments. Some generally endorsed the requirement for interlock at all front positions, some stated that it should not be required at any position, while others suggested that it should be installed only at the outboard seats or only at the driver's seat. Several comments indicated doubts as to the system's reliability and expressed concern about its possible interference with vehicle operation.

Upon review of the comments, the NHTSA has decided to adopt the interlock system as an option applying to all front seating positions. The 1973 options, whether active or passive, are intended to set minimum protection requirements for all front seating positions. If the third option is to give protection better than that of present belt systems, belt usage must be increased. The interlock system has the potential to increase belt usage and is therefore adopted as part of the third option. Exemption of the center front seat, as proposed by several comments, could result in increased occupancy of the center seat as an easy means of avoiding the effects of the interlock system. The effect of such avoidance would be to substantially lessen the protection afforded occupants, and the requests for center seat exemption are therefore denied. However, in consideration of some technical problems arising from the placement of sensors in the center seats, it has been decided to change the preconditions for warning system and interlock system operation. It was pointed out that the center seat cushion may be depressed far enough to activate the warning signal by the weight of two large men in the outboard positions. To alleviate this problem, S7.3.1(c), S7.3.5.2(b), and S7.4.1 (b) are changed to provide for activation by the weight of a child in the front non-driver positions only when a 50th percentile adult male is seated in the driver's position.

Other problems of convenience arising from the interlock system are dealt with by the addition of two new subsections to S7.4. As a convenience in situations such as parking garages or vehicles stalled in traffic, a new S7.4.3 has been adopted, permitting restarting of the engine within three minutes of shutoff without interference by the interlock system. To facilitate repair and maintenance work, a new S7.4.4 is adopted to permit the interlock to be overridden by a switch that is actuated after opening the cover of the engine compartment. To reduce the possibility that the engine compartment switch will be misused, S7.4.4 provides that the switch will not defeat the interlock unless it is operated after each period of engine operation.

The requirements of S7.3.3 and S7.3.4 have been amended by adding engine operation as a necessary condition for mandatory warning system shutoff. This limits the situation in which the system must not operate; it may now operate when the ignition is in the "start" position, as requested by General Motors.

The relationship of the "start" position to system operation is also affected by the interlock system requirements. S7.3.5.4 requires the warning system to operate when the ignition is in the start position to tell the driver of a vehicle with unbelted front seat occupants why the engine fails to start.

One additional feature of the belts used in interlock systems attracted considerable comment. The amendment to S7.1.1 that would require shoulder belts provided under S4.1.2.3 to have emergency-locking retractors has been adopted as proposed. The NHTSA regards the convenience of an emergency-locking retractor as a significant incentive for belt usage. In response to comments requesting an interpretation as to the number of retractors required, the standard permits a system with a single emergency-locking retractor acting on both lap and shoulder belts. In response to requests for allowance of auxiliary manual adjustment devices, such devices are permissible if they cannot be adjusted so as to cause the belt to fail the automatic adjustment requirements of Standard No. 208.

General Motors raised a question concerning the number of test devices to be used in the frontal barrier crash test specified in S5.1. The NHTSA has interpreted the section as requiring test devices only in those seating positions for which a barrier crash test is specified by S4. The question is of general interest and is considered significant enough to warrant a clarifying amendment to S5.1 at this time.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, § 571.208 of Title 49, Code of Federal Regulations is amended. The standard is hereby amended upon publication of this notice in the *Federal Register*; effective dates are as stated in the text of the standard.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority by the Secretary of Transportation to the National Highway Traffic Safety Administrator, 49 CFR 1.51.

Issued on February 17, 1972.

Douglas W. Toms
Administrator

37 F.R. 3911
February 24, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection—Pressure Vessels and Explosive Materials

(Docket No. 69–7; Notice 18)

The purpose of this notice is to add a new section to Motor Vehicle Safety Standard No. 208, *Occupant Crash Protection*, 49 CFR § 571.208, dealing with pressure vessels and explosive devices.

After review of the comments to the notice of proposed rulemaking (Docket 69–7, Notice 14, October 9, 1971; 36 F.R. 19705), the agency has concluded that its original assessment of the need for regulation was essentially correct and that a regulation should therefore be adopted. As indicated in Notice 14, the NHTSA sees a regulation of restraint systems such as air bags containing explosive materials or pressure vessels as having two primary functions: to impose directly on manufacturers the obligation to conform to Federal hazardous materials regulations, and to create a uniform system of regulation that will override any conflicting state or local regulation.

The approach taken in the notice was to propose a general incorporation of all applicable portions of the hazardous materials regulations as found in 49 CFR Parts 170–189. Most of the comments, while agreeing with the general intent of the proposal, objected to the breadth of this incorporation as too vague and too likely to result in difficulties of interpretation. There was a consensus that serious problems would arise as a result of the Hazardous Materials Regulations Board's practice of issuing special permits that allow shipment of regulated items that do not conform to the regulations. The majority of devices used in occupant protection systems vary in some way from the requirements of the regulations and have been shipped under one or more special permits. The comments pointed out that adoption of the regulations without some adjustment to allow for the existence of special permits would effectively prohibit most of these devices.

It has therefore been decided to limit the incorporation of the HMRB regulations by referencing those parts of the regulations from which no variances have been granted. Without exception, the pressure vessels used in air bag systems to date have been manufactured in basic conformity with the recently adopted Specification 39 (49 CFR 178.65). The variances which have caused the manufacturers to obtain special permits have been variances in the choice of materials and in the method of fabrication. All cylinders have been able to conform to the basic performance requirements of the specification, so that an incorporation into Standard 208 of the performance requirements of Specification 39 would enable manufacturers to continue to make their present systems.

Taken together, the performance requirements are considered by the NHTSA to be an adequate regulation of the safety of pressurized containers in occupant restraint systems. The HMRB will continue to exercise its jurisdiction over the shipment of the systems, so that a manufacturer will still have to obtain a special permit in order to ship systems that do not conform to the specification. The adoption of section S9 is not intended in any way to diminish the responsibilities of a manufacturer under the applicable regulations of the HMRB. For example, evidence of the requisite number of tests and inspections will continue to be required for shipment under the HMRB regulations, even though failure to test and inspect will not be a violation of Standard 208.

As adopted, the section consists of two subsections, the first dealing with pressure vessels and the second with explosives. The pressure vessel subsection applies to vessels that are designed to be continuously pressurized, as distinguished from systems that are pressurized only during actuation. A pressure vessel that contains an explosive charge as well as gas under continuous pressure will have to conform to both subsections.

A continuously pressurized vessel is required to conform to the requirements of Specification 39 concerning type, size, service pressure, and test pressure of vessels (paragraph 2 of the Specification); seams (6(b)); wall thickness (7); openings and attachments (9(a) and (b)); safety devices (10); pressure tests (11); and flattening tests (12). The reference to the latter two paragraphs are drafted to make it clear that the quality control aspects of those paragraphs are not included in the standard. The remaining portions of Specification 39, including the inspection requirements of paragraphs 3, 4, and 15, the material specifications of paragraph 5, the rejected cylinder procedure of paragraph 13, and the markings requirement of paragraph 14, are not incorporated.

Review of the explosives provisions of the hazardous materials regulations showed that some of the requirements, if applied literally, would not be appropriate for automotive installations. For instance, certain types of pyrotechnic inflators are categorized as explosive power devices and are required to be shipped in fiberboard or wooden containers. Neither of these types of containers would be proper for a system designed to protect occupants in a vehicle from the effects of a crash. The primary needs are for a requirement that sets limits on the sensitivity of the explosive and one that requires it to be in a container that will protect the occupants of the vehicle from the effects of inadvertent ignition. These requirements are hereby adopted, in accordance with comments made by General Motors.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

Effective date: June 12, 1972. Because of the immediate need to establish a uniform system of regulation, good cause is found for an effective date sooner than 180 days after issuance.

This amendment is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407 and the delegation of authority at 49 CFR 1.51.

Issued on May 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 9222
May 6, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 19)

The purpose of this notice is (1) to adopt the method of calculating head injury proposed in Notice 17 of Docket 69–7 (37 F.R. 5507) as an amendment to S6.2 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, and (2) to respond in part to petitions for reconsideration of the amendments to the standard published in Notice 16, February 24, 1972 (37 F.R. 3911). The issue involving Notice 16 addressed by this notice is the applicability of the head injury criterion of S6.2 to seat belt restraint systems. Action on the remaining issues has been scheduled for completion not later than July 1, 1972.

I. *Calculation of head injury criterion.*

Some substantive objections were raised to the proposed method of calculating the head injury criterion. Several comments questioned the use of resultant accelerations rather than the anterior-posterior accelerations used in the original development of the Wayne State University Tolerance Curve. Although the curve was originally based on anterior-posterior acceleration data, its validity for resultant accelerations appears to be confirmed by subsequent tests using resultant accelerations computed from biaxial accelerometers. Resultant accelerations have therefore been used in the amended criterion.

The question of the permissible level was again raised, with some commenters supporting a level of 1500 even under the revised method of calculation. This agency's position is that adequate justification has not been demonstrated for a numerical increase in the severity level, although adjustments in the method of calculation adopted herein may have the effect of allowing greater cumulative accelerations than would have been allowed under the Gadd Severity Index. With the new calculation, the higher numerical level is less supportable than before and it is accordingly rejected. The amendment to S6.2 is adopted as proposed.

II. *Applicability of the head injury criterion to seat belt systems.*

The decision to postpone the date of mandatory installation of passive restraints until August 15, 1975, was made in consideration of the hardship that would have been imposed on many manufacturers by a requirement to provide passive restraints by the original date of August 15, 1973. The injury criteria of the standard, measured in a barrier crash with instrumented dummies, were applied to belt systems as well as passive systems that might be used to meet the requirements of the standard, beginning August 15, 1973.

Several manufacturers have petitioned for the removal of the injury criteria, particularly those for head injury, from the belt system tests. Their concern arises from their test results indicating that in many vehicles currently available belt systems either do not meet or only marginally meet the head injury criteria. They have argued that much, perhaps most, of the acceleration that contributes to the head Severity Index measurement with a shoulder-belted dummy occurs as the head flops loosely forward without striking anything in the vehicle. Actual field collision data, they maintain, does not indicate that this type of head movement by shoulder-belted vehicle occupants in a crash is a serious injury-producing factor. They question the correlation between results of the dummy tests and the actual protective characteristics of the belt systems.

The NHTSA recognizes the uncertainty concerning the significance of head movement by a shoulder belted occupant whose head does not strike the forward part of the vehicle, although it considers the present evidence too scanty to be conclusive in either direction. It also recognizes that the leadtime for any major design or component changes for the 1974 models has been virtually exhausted. Recent materials submitted to the docket indicate that presently existing inflatable restraint systems can meet the head injury criteria with little difficulty. The inherent limitations in lap-and-shoulder-belt systems make it considerably more difficult for those systems to meet these criteria, although belt systems have been found to provide protection at moderate speeds.

For these reasons, it has been decided that a temporary modification in the head injury measurements for belt systems is justified. The amendment made by this notice in response to the petitions affects vehicles manufactured before August 15, 1975, and provides that measurement of head acceleration begins, for purposes of computing the head injury criterion for belted dummies, only at the moment at which the head strikes some portion of the vehicle other than a belt. The measurement will thus include any contact with the windshield or dashboard, for example, or the effects of rebound against the seat back, but pre-impact accelerations of the head will be excluded.

This agency will examine closely the accident data bearing on the traumatic effect of nonimpactive head accelerations, as well as such laboratory data as may be gathered, for example from cadaver studies. Work is also in progress concerning the correlation between dummy and human behavior, with a view to more sophisticated instrumentation and measurement of vehicle performance, and to continued evaluation of the head injury criterion for the entire test crash event.

In consideration of the foregoing, paragraph S6.2 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

Effective date: July 24, 1972.

Because this amendment modifies an existing rule in a manner that imposes no additional substantive requirements, it is found for good cause shown that an effective date less than 180 days from the date of issuance is in the public interest.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on June 20, 1972.

Douglas W. Toms
Administrator

37 F.R. 12393
June 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69–7; Notice 20)

The purpose of this notice is to respond to petitions for reconsideration of the seat belt interlock requirements of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, as published February 24, 1972 (37 F.R. 3911). The issues in the petitions relating to the applicability of the head injury criterion of S6.2 to seat belt systems have been answered in a notice published June 24, 1972 (37 F.R. 12393). The remaining issues are discussed herein.

Several petitions raised issues which, while of considerable importance, lie outside of the immediate scope of the notice under review. Among these are requests to exempt vehicles that meet the injury criteria from the requirements of Standards Nos. 201, 203, 204, and 212, and to waive some of the requirements of Standard No. 209 relating to the width and elongation of webbing. As indicated in the Program Plan for Motor Vehicle Safety Standards, several of these matters are under review at the present time. Their resolution will await the issuance of rulemaking notices in the respective dockets.

General Motors reiterated its opposition to the requirements for rollover protection and for the protection of rear seat occupants by passive means. Although these issues may be affected by the receipt of additional information, the NHTSA has not found sufficient cause to alter its position.

With respect to the interlock option itself, the petitioners objected less to the concept of such a system than to the positions at which it would have to be installed and to the level of protection required of it. Some requested an indefinite extension of the interlock requirements beyond August 15, 1975, as a more or less permanent substitute for passive protection. Inasmuch as the NHTSA continues to consider the 1975 date to be a reasonable date for the installation of passive systems, it must again deny the requested delay.

The application of the interlock and belt warning systems to the center front seating position drew a number of adverse comments. It was stated that the center seat occupancy rate was too low to justify the added cost of installing the system and that the system would be prone to inconvenient activation, as when two large men at the outboard positions depress the center seat cushion. On the question of cost effectiveness, the agency has found that the available data do not support the petitioners. Despite the relatively low occupancy rate, the incremental cost of installing the system is low enough to create a favorable ratio. The requirement for center seat installation is therefore retained. To avoid the problems of over-sensitivity, it has been decided to raise the threshold weight at which activation is required, in accordance with a suggestion by American Motors. The relevant sections (S7.3.5.2(b) and S7.4.1(b)) are accordingly amended to refer to a 5th-percentile adult female rather than to a 50th-percentile 6-year-old child.

The petitions directed their strongest objections to the application of the injury criteria to belt systems. Partial relief has been granted to belt systems with respect to the head injury criterion. The chest and femur criteria, to which a lesser amount of criticism has been directed, are not considered to present the same level of difficulty for belt systems of current design as the head.

However, it has been decided to make an interim adjustment of the chest injury criterion with respect to seat belts by applying to them a criterion using the severity index formerly applied to the head. The effect of this is to ease the requirement somewhat without permitting excessive long duration accelerations. A well designed belt system of the current types will be capable of meeting the revised criterion. It is expected that improvements now in prospect will allow belt systems to meet the 60 "g's", 3 millisecond criterion in 1975. Femur loads are not a problem for seat belt systems that do not separate during impact, and the femur criterion is therefore retained.

Ford stated in its petition that two barrier tests would be required under S4.1.2.3(d) and (e) for some vehicles, due to the difficulty of placing three 50th-percentile male dummies in the front seat. Although it may be that correct placement cannot be made in Ford vehicles, Ford is at liberty to devise a method of testing the center position which imposes a stress on the belt system equivalent to that of a 50th-percentile adult male. It does not appear that the size of the dummies will prevent most cars from being tested with the dummies three abreast, if the manufacturers elect to conduct **S4.1.2.3.1**(d) and (e) as a single test. Ford's petition is therefore denied.

General Motors, alone among the petitioners, suggested the use of a sequenced warning system in place of the interlock system. In part the company's position was grounded on the belief that the standard presently requires a sequenced warning and that the interlock is therefore a redundant system. In fact, the opposite is true under the present wording of the standard, in that S7.3.2 states that the warning system shall not operate when the belt is extended to a specified length or, alternatively, when the belt is buckled. Because a sequential warning system would necessarily cause the signal to operate in some situations despite the belt's being extended or buckled, it would not be allowed under S7.3.2.

In response to the GM request to substitute the sequenced warning for the interlock, the NHTSA has concluded that the interlock coupled with a nonsequenced warning provides a somewhat more direct incentive to belt usage with less potential for causing irritation while the vehicle is in operation. The interlock feature is therefore being retained. However, in the light of GM's expressed preference for a sequential warning and in response to a petition by the Japan Automobile Manufacturers Association to permit sequential operation of the warning, it has been decided to amend S7.3.2 to permit manufacturers to use a sequenced warning in conjunction with the interlock system.

The Japan Automobile Manufacturers Association requested the addition of the phrase "after the seat has been occupied" to S7.3.2(a) and (b). Because this would have the effect of requiring all warning systems to be sequenced, paragraphs (a) and (b) are not being amended. Instead, a new paragraph (c) is being added as a third mode of warning system shut off. Although by its terms the new paragraph applies only to front outboard positions, S7.3.5.3 will operate on it as on the other paragraphs to apply it to the center front position as well.

It should be pointed out that a manufacturer adopting the sequential option will be free to incorporate anti-bounce features into the system to prevent its being knocked out of sequence when the occupant lifts off the seat momentarily. This is so because under S7.3.1 the warning system is required to operate only when the belts have not been extended or buckled. If the occupant, in moving about on the seat, does not unbuckle or retract the belt, the warning would not be *required* to operate and the manufacturer could therefore provide for nonoperation in such situations.

Toyota has requested the application of S7.4.3 and S7.4.4 to the warning system as well as the interlock. Because of the possibility that such an amendment would result in the warning system's activating unexpectedly while the vehicle is in motion, the petition is denied.

Several petitions addressed the convenience features of the interlock system in S7.4.3 and S7.4.4. Chrysler stated that it understood the reference in S7.4.3 to "after the engine has been stopped" to mean after the ignition has been turned off, so that a stalled engine could be restarted indefinitely so long as the ignition is not turned off. This interpretation is essentially correct. The quoted phrase refers to the act of stopping the engine, rather than to involuntary engine stoppage. However, to make it clear that the engine may be restarted indefinitely if the engine has not been turned off, the section is being amended to make its intent explicit.

General Motors stated that it would be desirable for the engine starting system to be operable indefinitely without interference from the interlock system after the engine is stopped so long as the driver has not left his seated position. Such a provision would be an alternate means of permitting restarting in emergency road situations and it is therefore being adopted as part of S7.4.3.

As amended S7.4.3 continues to refer to starting after the engine has stopped, to make it clear that the features of S7.4.3 will not interfere with the primary function of the interlock system. Although it is not necessary for the engine to operate under its own power, the engine starting system must at least be operated in a manner that would start a functional engine in order for the convenience features to have any effect.

A related issue arises in the context of S7.4.4, which refers to restarting "after each period of engine operation." Chrysler interprets this to mean the cycling of the ignition switch from "off" to "on" to "off" again. Although the language does not support this meaning, on reconsideration it has been decided that there are advantages to an engine compartment switch that does not require the engine to rotate in order to be reset. The section is therefore being amended to refer to the cycling of the ignition switch rather than to engine operation.

The requirement that the switch be operated each time in order to permit engine starting is being retained despite the request of several petitioners for a system that would permit unlimited restarting so long as the hood is open. The agency's primary objection to such a system is that it is too easy to override permanently. The system allowed by S7.4.4 may be somewhat less convenient, but it is also less defeatable and is therefore preferred. The switch may be located so that it will be operable by the raising of the hood, as requested by several petitioners.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR § 571.208, is amended. . . .

Effective Date: 180 days after publication in the *Federal Register.*

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. § 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on June 30, 1972.

Douglas W. Toms
Administrator

37 F.R. 13265
July 6, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69-7; Notice 22)

The purpose of this notice is to specify the effective date for the amendment to Motor Vehicle Safety Standard No. 208 published July 6, 1972, (Notice 20; 37 F.R. 13265). In the effective date provision of the notice, it was stated that the amendment became effective 180 days after publication in the *Federal Register*. Calculation of 180 days from July 6, 1972, the publication date, results in an effective date of January 2, 1973. For reasons of consistency and clarity, it has been found preferable to establish January 1, 1973, as the effective date.

The amendment to Motor Vehicle Safety Standard No. 208, 49 CFR 571.208, published at 37 F.R. 13265 is therefore made effective January 1, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on August 3, 1972.

Douglas W. Toms
Administrator

37 F.R. 16186
August 11, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection in Passenger Cars, Multipurpose Passenger Vehicles, Trucks and Buses

(Docket No. 69–7; Notice 23)

The purpose of this notice is to reply to petitions filed pursuant to 49 CFR 553.35 requesting reconsideration of the requirements of Motor Vehicle Safety Standard No. 208 relating to seat belts in vehicles manufactured after August 15, 1973, as amended by Notices 19 and 20 of Docket 69–7 (37 F.R. 12393; 37 F.R. 13265).

1. *Seat belts and the injury criteria of S6.* The primary objection raised by petitioners is that Notices 19 and 20 did not altogether revoke the requirement that seat belts used to meet the 1973 interlock option must be capable of meeting the injury criteria of S6. Although review of the petitions suggests that additional modification of the head injury criterion is advisable, the NHTSA declines to grant petitioners' request for complete relief from the injury criteria.

Review of the petitions for reconsideration of Notice 16 showed that belts would have difficulty meeting the full criteria. Since leadtime was insufficient for major design changes in belts before 1973, it was found necessary either to remove the injury criteria or modify them so that the changes needed to enable belts to conform could be made in 1973.

Upon review, it was concluded that the injury criteria, even in modified form, would have the beneficial effect of regulating the overall protection characteristics of the occupant compartment and belt system. Regulation of the seat belt as a separate component, as in Standard 209, does not insure that the belt will be installed in a manner calculated to insulate the occupant from injurious contact with the interior of the vehicle. It was therefore decided to retain the injury criteria, with such modifications as seemed necessary to allow manufacturers to conform to S4.1.2.3 by August 15, 1973.

The most significant, though by no means the only, agent of head injury is impact with the vehicle interior. In reviewing the petitions on Notice 16, it was decided that no interim criteria would be acceptable that disregarded any impact-related accelerations. Notice 19 therefore amended the head injury criterion in a manner that was intended to include all impact accelerations and to disregard the effect of non-impact accelerations. As several petitioners point out, however, the amendment did not fully carry out this intent. S6.2, as amended, would have disregarded only those accelerations occurring before the head impacted the vehicle and would have counted all accelerations after that point. One effect of this formula was that a glancing impact, in itself insignificant, would cause all subsequent non-impact accelerations to be counted even though such accelerations would not be distinguishable in kind from the pre-impact acceleration. To avoid this result, the agency has decided to include in the calculation of the head injury criterion only those accelerations that occur while the head is in contact with the vehicle.

Some petitioners suggested that even while the head is touching the vehicle, a significant part of the head's deceleration is due to the restraining action of the belt and not to the surface the head strikes. Although there is undeniably more than one force that contributes to head deceleration, the force produced by the impacted surface becomes increasingly important as the duration of the impact increases. If the accelerations during an impact are of such an amplitude and duration that a HIC value of 1,000 is approached, the acceleration caused by the belt is generally insignificant. The criterion therefore counts all accelerations during the impact phase.

The chest injury criterion of S6.2 was modified for seat belts by Notice 20, which substituted a severity index of 1,000 for the 60g 3 millisecond criterion applied to other restraint systems. Although the use of the severity index as an indicator of chest injury has not been common practice, the agency has decided that it provides a reasonable interim measure of the effectiveness of the belt system. The severity index of 1,000 is therefore retained as the criterion for belt systems until August 15, 1975.

2. *Passive belts and injury criteria after August 15, 1975.* Several petitioners stated that any relief granted to seat belts in the period 1973–1975 should be extended to passive belt systems in the period beyond 1975. However, the NHTSA adopted the interim criteria out of consideration for lead time problems, not because it considered them to be fully satisfactory. The agency does not consider any criterion to be acceptable, on a permanent basis, that omits potentially injury-causing accelerations from its computation. Even though impact accelerations may be the major threat to belted occupants, the effects of non-impact accelerations are not negligible and should not be ignored. It is expected that belts will be able to meet the full injury criteria by 1975. The petitions requesting extension of the modified criteria beyond 1975 are therefore denied.

3. *MPV's and trucks manufactured before August 15, 1977.* The adoption of the interlock option for passenger cars under S4.1.2.3 permitted multipurpose passenger vehicles and trucks of less than 10,000 pounds GVWR to continue to use belt systems (with interlocks) in the period between 1975 and 1977. The agency's intent was to permit these vehicles to have the same interlock system during 1975–1977 that is permitted for passenger cars during 1973–1975. In response to several petitioners, who pointed out that S6.2 and S6.3 could be understood to require these vehicles to meet the full injury criteria during this period, the sections are hereby amended to extend the injury criteria modifications until August 15, 1977, for MPV's and trucks of less than 10,000 pounds GVWR.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208, is amended. . . .

Effective date: August 15, 1973.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR § 1.51.

Issued on October 18, 1972.

Douglas W. Toms
Administrator

37 F.R. 22871
October 26, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69–7; Notice 25)

The purpose of this notice is to amend the injury criteria specified for the chest and femur under sections S6.3 and S6.4 of Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208. The amendments adopted hereby are those proposed in a notice of proposed rulemaking published on October 28, 1972 (Notice 24; 37 F.R. 23115).

The injury criterion for the chest is amended with respect to all vehicles manufactured before August 15, 1975, by substituting a severity index value of 1,000 as the measure of injury potential in place of the criterion of 60g's for 3 milliseconds. The substitution had previously been made for vehicles equipped with seat belt systems manufactured before August 15, 1975. The amendment made hereby is based on a finding that the severity index is an acceptable interim measure for restraint systems other than belt systems.

Several comments noted an oversight in Notice 24 concerning the application of the modified chest criterion to multipurpose passenger vehicles and trucks having GVWR's of 10,000 pounds or less. As a result of a previous notice (Notice 23; 37 F.R. 22871, October 26, 1972), these vehicles had been permitted to meet the modified criterion until August 15, 1977. Notice 24 failed to reflect this change. The omission has been corrected in the amended version of S6.3, and a parallel extension has been made for vehicles other than passenger cars that have restraint systems other than belts.

The injury criterion for the upper legs is amended to specify a maximum force of 1700 pounds on each femur rather than the previously specified force of 1400 pounds. The new requirement is considered to provide a good level of protection in crashes in the 30 m.p.h. range and allows manufacturers greater latitude in designing systems for protection at higher speeds.

None of the comments disagreed with the proposal for an increase in force level, although the Ford Motor Company suggested a further amendment that would permit higher forces for a cumulative interval of not more than 3 milliseconds, thereby disregarding extremely short period acceleration peaks which Ford considers to be artificial products of the dummy's metallic structure. A similar request has been made by General Motors in a recent petition for rulemaking. The agency has not yet completed its evaluation of this issue. If favorable action is decided upon, a notice of proposed rulemaking will be issued to permit additional comment.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, Occupant Crash Protection, 49 CFR 571.208, is amended . . . .

Because this amendment relieves a restriction and imposes no additional burden, an immediate effective date is found to be in the public interest.

Effective date: November 23, 1972.

This notice is issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407, and the delegation of authority at 49 CFR 1.51.

Issued on November 20, 1972.

Charles H. Hartman
Acting Administrator

37 F.R. 24903
November 23, 1972

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Seat Belt Interlock Amendments

(Docket No. 69-7; Notice 27)

The purpose of this notice is to amend the seat belt interlock requirements of Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208). The amendments relate to the performance requirements applicable to the belts, the positions at which the interlock is to be provided, and the convenience features allowed in certain driving situations.

The amendments adopted hereby were initially proposed in a notice published April 20, 1973 (Docket 69-7, Notice 26; 38 F.R. 9830). Some of the amendments proposed in Notice 26 have been adopted in revised form as a result of the comments. One proposal, concerning an alternative interlock system, is not adopted by this notice and awaits further rulemaking action as discussed below.

I. *Amendments.* In Notice 26, it was proposed to amend Section S4.1.2.3, the section establishing the seat belt interlock option, by deleting the requirement that the belts in the front outboard positions meet the injury criteria of S5.1 and by deleting the requirement that the belt at the center front position meet a breakage test in a barrier crash. It was also proposed to delete the requirement for an interlock at the center front position.

Subject to continuing reservations about the interlock system itself, the comments were generally favorable to the proposed amendments. The mandatory requirements for meeting the injury criteria at the outboard positions and the breakage test at the center front position are hereby deleted, as proposed.

There were objections to certain details of the proposal. Under the injury criteria version of S4.1.2.3, manufacturers were allowed to install either Type 2 seat belts (lap and shoulder belt combinations) or Type 1 seat belts (lap belt). Without the injury criteria as a control on the performance of the lap belt, it was proposed in Notice 26 to delete the Type 1 belt option under S4.1.2.3.1(a). Ford Motor Company stated that if Type 1 belts were not permitted, evaluation of systems employing lap belts in conjunction with passive upper torso restraint would be inhibited. Although belts may be used with passive restraints under the second restraint option in 1973 (S4.1.2.2), second option systems must be capable of providing fully passive protection in a frontal crash. To permit evaluation of systems that may not have full passive capability, it has been decided to continue to permit Type 1 belts under the third option (S4.1.2.3(a)) on the condition that they are capable of meeting the injury criteria of S5.1 in a frontal perpendicular crash.

As amended, therefore, S4.1.2.3.1(a) provides that at the front outboard positions a manufacturer may install either a Type 2 seat belt assembly that conforms to Standard No. 209, or a Type 1 seat belt assembly that meets the injury criteria of S5.1. Insofar as the injury criteria themselves are contingent upon the establishment of an adequate method of measurement through the adoption of a new test dummy, a manufacturer who intends to produce vehicles with Type 1 belts at the front outboard positions will have to await the adoption of the new dummy regulation and its incorporation into the options under S4.1.2.

The proposed deletion of the interlock requirement for the center front position (S4.1.2.3.1(b)) was favorably received, and the requirement is hereby deleted. It was stated by Ford, Chrysler, and American Motors that the warning system at that position should also be deleted. The merits of the warning system at the center position, in the form of increased belt usage, are considered by NHTSA to outweigh its drawbacks. Although it is fair to say that the warning system will be somewhat more likely to fail with three sensors in the system than with two sensors, the agency does not consider the increment to be sufficient to justify deleting the warning system. The temporary difficulties that Chrysler and American Motors will experience in the severance of the interlock from the warning system are also not considered sufficient grounds for deletion of the warning system. Section S4.1.2.3.1(b) is therefore adopted as proposed in Notice 26. The remaining provisions of S4.1.2.3 were not objected to, and are also adopted as proposed.

A request to clarify section S7.4.1, by amending the second sentence of the section to refer to "each occupied front outboard seating position," has been favorably considered and is adopted hereby.

An amendment to S7.4.3 was proposed to allow an additional "free-start" mode, whereby the manufacturer could install a timer that would be actuated by the seat switch and that would allow the vehicle to be started without belt operation within a period of up to three minutes after the driver leaves his seat. Reaction to the proposal was favorable. In particular, the National Parking Association indicated that such a provision would alleviate most problems in the parking of cars in garages. The amendment is being adopted as proposed.

The proposed addition of section S7.4.5 proved unexpectedly controversial, due to an apparent divergence of opinion on the question of whether, without S7.4.5, a seat bounce switch would be permitted for the interlock system. It has been the opinion of NHTSA that the interlock requirements do not permit the starter to operate in the event that a person who has operated the belt in the correct sequence gets off the seat and returns to it before attempting to start the car. The majority of manufacturers construed the interlock requirements as permitting operation in the situation just described, and had therefore designed their systems with seat bounce switches. Rather than appearing permissive, as intended, the 10 second bounce switch proposed by S7.4.5 was therefore seen by most manufacturers as unduly restrictive.

Upon consideration of the comments, the agency has concluded that the predominant varieties of bounce switch described by the comments can be accommodated by a modest revision of the section. Two main types of switch were described, one involving a timer set for interval of from ten seconds to a minute and a half or more, and the other involving the door switches in the circuit, so that after being correctly sequenced the system would allow the car to be started despite "bounces" of any duration, so long as the doors have not been opened. As adopted, the section permits a manufacturer to choose either system. If he chooses a timed system, he may allow any time up to three minutes. Each of the varying time periods described in the comments would therefore be allowed.

The proposed alternative interlock system, S7.5, was treated favorably or neutrally in the comments, although none indicated plans to adopt such a system. The agency continues to regard the alternative system favorably, but on review of the comments has concluded that there is merit to the suggestion that the convenience features established for the primary interlock system should also be applied to the alternative system. In addition, it appears desirable to incorporate a requirement for warning system operation similar to that of S7.3.5.4 to tell a driver who has not operated his belt why the car cannot be moved. Final action on the proposed S7.5 is therefore being delayed in order to obtain comments on additional features of the system that are to be proposed in an upcoming notice.

II. *Other related matters.* After the publication of Notice 26, several comments and petitions were received on the subject of seat belts and the seat belt options. In its comment to Notice 26, Toyota restated its earlier request for amendment of Standard 209 to permit narrower webbing for portions of the belt that do not touch the occupant. Favorable action on this request is proposed in a notice published in today's edition of the *Federal Register* (38 F.R. 12414).

In a petition for rulemaking submitted May 15, 1973, Nissan Motor Company requested an amendment of the seat belt option that is in effect until August 15, 1973 (S4.1.1.3). The option presently requires all front outboard seat belts to meet a breakage test in a 30 mph barrier crash (S4.1.1.3(c)). Nissan stated that the finding in Notice 26 that the breakage test does not contribute significantly to the strength of the belt should be extended to belts in vehicles manufactured before August 15, 1973, as well as to belts in vehicles manufactured after that date, and that S4.1.1.3(c) should be deleted accordingly. The agency agrees with Nissan that that finding in Notice 26 is equally applicable to pre-August vehicles, but it does not consider an amendment of the standard necessary to afford the relief Nissan requests. Although the opinions in *Chrysler* v. *DOT*, 474 F.2d 659 (6th Circuit 1972) and *Ford* v. *NHTSA*, 473 F.2d 1241 (6th Circuit, 1973), did not deal directly with the non-passive options in effect before August 15, 1973, a side effect of the court's invalidation of the test dummy specifications of S8.1.8 is to leave the belt breakage test of S4.1.1.3(c) without a means of measurement.

The agency has concluded that the belt breakage test of S4.1.1.3(c) is without effect in the absence of a test dummy. It will therefore not seek to enforce the requirement. In view of the short time remaining before S4.1.1.3 and other current options lapse in favor of the August 15, 1973 options, this interpretation will have a marginal effect on currently produced vehicles, all of which have been certified as complying with the breakage test. It may, however, be of benefit to manufacturers who plan to introduce their 1974 models prior to August 15, 1973.

Several comments stated that the passive restraint requirement for August 15, 1975, and August 15, 1977, should be deleted from the text of the standard as a result of *Chrysler* v. *DOT*, *supra*, and reinstated only after issuance of the dummy regulation. A petition filed by the Center for Auto Safety, in contrast, seeks to have the August 15, 1975, date established as promptly as possible. The NHTSA position is that the decision in *Chrysler* v. *DOT* suspends the mandatory passive restraint requirements, regardless of whether they remain in the text of the rule, and that their deletion at this time would have no effect other than to require additional work at a later date.

Rulemaking, in addition to that now in progress with respect to the optional passive requirements, will be necessary in order to reestablish the date when passive restraints will be required. Before such rulemaking can be initiated, NHTSA is obliged to consider the comments it receives on the proposed test dummy regulation.

There has been some residual uncertainty as to the effect of the denial in Notice 26 of the petitions requesting restraint options in place of, or in addition to, the interlock system. The agency denied the petitions "to the extent that the petitions seek removal of the interlock requirement from the front outboard seats. . . ." It intended thereby to deny those petitions that would have added a fourth restraint option in addition to the interlock as well as to deny those that sought deletion of the interlock, and the language of denial in Notice 26 should be so construed.

The alternative interlock system proposed by Mr. Jesse R. Hollins, which was not discussed in detail in Notice 26, had been reviewed at the time of Notice 26 and was intended to be denied. The agency has again reviewed Mr. Hollins' petition and has again concluded that the benefits of his proposed system do not warrant the creation of such an alternative interlock system. His petition is accordingly denied.

In consideration of the foregoing, Motor Vehicle Safety Standard No. 208, 49 CFR § 571.208, is amended in pertinent part as set forth below. Because this amendment imposes no additional burdens an effective date earlier than 180 days after issuance of this notice is found to be in the public interest.

Effective date: August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, 15 U.S.C. 1392, 1407; delegations of authority at 38 F.R. 12147.

Issued on June 15, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 16072
June 20, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 73–8; Notice 2)

The purposes of this notice are (1) to adopt a regulation that specifies a test dummy to measure the performance of vehicles in crashes, and (2) to incorporate the dummy into Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208), for the limited purpose of evaluating vehicles with passive restraint systems manufactured under the first and second restraint options between August 15, 1973, and August 15, 1975. The question of the restraint system requirements to be in effect after August 15, 1975, is not addressed by this notice and will be the subject of future rulemaking action.

The test dummy regulation (49 CFR Part 572) and the accompanying amendment to Standard No. 208 were proposed in a notice published April 2, 1973 (38 F.R. 8455). The dummy described in the regulation is to be used to evaluate vehicles manufactured under sections S4.1.2.1 and S4.1.2.2, (the first and second options in the period from August 15, 1973, to August 15, 1975), and the section incorporating the dummy is accordingly limited to those sections. The dummy has not been specified for use with any protection systems after August 15, 1975, nor with active belt systems under the third restraint option (S4.1.2.3). The recent decision in *Ford* v. *NHTSA*, 473 F. 2d 1241 (6th Cir. 1973), removed the injury criteria from such systems. To make the dummy applicable to belts under the third option, the agency would have to provide additional notice and opportunity for comment.

By invalidating the former test dummy specification, the decision in *Chrysler* v. *DOT*, 472 F. 2d 659 (6th Cir. 1972), affected the restraint options in effect before August 15, 1975, as well as the mandatory passive restraint requirements that were to be effective after that date. A manufacturer who built cars with passive restraints under one of the options would therefore be unable to certify the cars as complying with the standard, as illustrated by the necessity for General Motors to obtain a limited exemption from the standard in order to complete the remainder of a run of 1,000 air-bag equipped cars.

The immediate purpose of this rulemaking is to reconstitute those portions of the standard that will enable manufacturers to build passive restraint vehicles during the period when they are optional. The test dummy selected by the agency is the "GM Hybird II", a composite developed by General Motors largely from commercially available components. GM had requested NHTSA to adopt the Hybrid II on the grounds that it had been successfully used in vehicle tests with passive restraint systems, and was as good as, or better than, any other immediately available dummy system. On consideration of all available evidence, the NHTSA concurs in this judgment. One fact weighing in favor of the decision is that General Motors has used this dummy to measure the conformity of its vehicles to the passive protection requirements of Standard 208, in preparation for the announced introduction of up to 100,000 air-bag-equipped vehicles during the 1974 model year.

No other vehicle manufacturer has announced plans for the production of passive restraint systems during the optional phase, nor has any other vehicle manufacturer come forward with suggestions for alternatives to Hybrid II. The NHTSA would have considered other dummies had some other manufacturer indicated that it was planning to produce passive restraint vehicles during the option period and that some other dummy had to be selected in order to allow them to proceed with their plans. If there had been any such plans, NHTSA would have made every effort to insure that a test device satisfactory to said manufacturer would have been selected.

This agency recognizes that since various types of dummy systems have been in use under the previous specification, any selection of one dummy, as is required by the *Chrysler* decision, will necessitate readjustments by some manufacturers. However, considering the quantity of GM's production, the scope and advanced state of its passive restraint development program, and the fact that the Hybrid II does not differ radically from other dummies currently in use, in the NHTSA's judgment that dummy represents the best and least costly choice. That conclusion has not been contradicted by the comments to the docket.

The agency will not make any final decision regarding reinstatement of mandatory passive restraint requirements without further notice and opportunity for comment. Should the agency propose mandatory passive restraint requirements, the question of the conformity of the dummy that is chosen with the instructions of the court in *Chrysler* will again be open for comment. The NHTSA strongly encourages the continuance of the dummy test programs mentioned in the comments, in the hope that any problems that may arise can be identified and resolved before the dummy specifications for later periods are issued.

The Hybrid II dummy has been found by NHTSA to be a satisfactory and objective test instrument. In sled and barrier tests conducted by GM with the GM restraint systems and in sled tests conducted by Calspan Corp. on behalf of NHTSA, the Hybrid II has produced results that are consistent and repeatable. This is not to say that each test at the same nominal speed and deceleration has produced identical values. In testing with impact sleds, and to an even greater extent with crash-tested vehicles, the test environment itself is complex and necessarily subject to variations that affect the results. The test data show, however, that the variance from dummy to dummy in these tests is sufficiently small that a manufacturer would have no difficulty in deciding whether his vehicle would be likely to fail if tested by NHTSA.

The provisions of the dummy regulation have been modified somewhat from those proposed in the notice of proposed rulemaking, largely as a result of comments from GM. Minor corrections have been made in the drawings and materials specifications as a result of comments by GM and the principal dummy suppliers. The dummy specification, as finally adopted, reproduces the Hybrid II in each detail of its design and provides, as a calibration check, a series of performance criteria based on the observed performance of normally functioning Hybrid II components. The performance criteria are wholly derivative and are intended to filter out dummy aberrations that escape detection in the manufacturing process or that occur as a result of impact damage. The revisions in the performance criteria, as discussed hereafter, are intended to eliminate potential variances in the test procedures and to hold the performance of the Hybrid II within the narrowest possible range.

General Motors suggested the abandonment of the definition of "upright position" in section 572.4(c), and the substitution of a set-up procedure in section 572.11 to serve both as a positioning method for the performance tests and as a meansurement method for the dummy's dimensions as shown in the drawings. The NHTSA does not object to the use of an expanded set-up procedure, but has decided to retain the term "upright position" with appropriate reference to the new section 572.11(i).

The structural properties test of section 572.5(c), which had proposed that the dummy keep its properties after being subjected to tests producing readings 25 percent above the injury criteria of Standard No. 208, has been revised to provide instead that the properties must be retained after vehicle tests in accordance with Standard No. 208.

The head performance criteria are adopted as proposed. The procedures have been amended to insure that the forehead will be oriented below the nose prior to the drop, to avoid interference from the nose. In response to comments by the Road Research Laboratory, American

Motors, and GM, an interval of at least 2 hours between tests is specified to allow full restoration of compressed areas of the head skin.

The neck performance criteria are revised in several respects, in keeping with GM's recommendations. The pendulum impact surface, shown in Figure 4, has been modified in accordance with GM's design. The zero time point has been specified as the instant the pendulum contacts the honeycomb, the instructions for determining chordal displacement have been modified, and the pulse shape of the pendulum deceleration curve has been differently specified. The maximum allowable deceleration for the head has been increased slightly to 26g. In response to suggestions by the Road Research Laboratory and the Japan Automobile Manufacturers Association (JAMA), as well as GM, a tolerance has been specified for the pendulum's impact velocity to allow for minor variances in the honeycomb material.

With respect to the thorax test, each of the minor procedural changes requested by GM has been adopted. As with the head, a minimum recovery time is specified for the thorax. The seating surface is specified in greater detail, and the test probe orientation has been revised to refer to its height above the seating surface. The test probe itself is expressly stated to have a rigid face, by amendment to section 572.11, thereby reflecting the probes actually used by NHTSA and GM. A rigid face for the probe was also requested by Mercedes Benz.

The test procedures for the spine and abdomen tests are specified in much greater detail than before, on the basis of suggestions by GM and others that the former procedures left too much room for variance. The test fixtures for the spinal test orientation proposed by GM, and its proposed method of load application have been adopted. The parts of the dummy to be assembled for these tests are specifically recited, and an initial 50° flexion of the dummy is also specified. The rates of load application and removal, and the method of taking force readings are each specified. The direction of force application is clarified in response to a comment by Volvo.

The abdomen test is amended with respect to the initial point of force measurement, to resolve a particular source of disagreement between GM's data and NHTSA's. The boundaries of the abdominal force-deflection curve are modified to accord with the measurements taken by GM subsequent to the issuance of the notice. The rate of force application is specified as not more than 0.1 inch per second, in response to comments by Mercedes Benz, JAMA, and GM.

The test procedures for the knee tests are revised to specify the type of seating surface used and to control the angle of the lower legs in accordance with suggestions by JAMA, the Road Research Laboratory, and GM. The instrumentation specifications of section 572.11 are amended to clarify the method of attachment and orientation of the thorax accelerometers and to specify the channel classes for the chest potentiometer, the pendulum accelerometer, and the test probe accelerometer, as requested by several comments.

The design and assembly drawings for the test dummy are too cumbersome to publish in the *Federal Register*. During the comment period on the April 2 notice, the agency maintained master copies of the drawings in the docket and placed the reproducible mylar masters from which the copies were made with a commercial blueprint facility from whom interested parties could obtain copies. The NHTSA has decided to continue this practice and is accordingly placing a master set of drawings in the docket and the reproducible masters for these drawings with a blueprint facility.

The drawings as adopted by this notice differ only in minor detail from those that accompanied the April 2 notice. The majority of the changes, incorporated into corrected drawings, have already been given to those persons who ordered copies. The letter of June 13, 1973, that accompanied the corrected drawings has been placed in the docket. The June corrections are incorporated into the final drawing package. Additional adjustments are made hereby to reflect better the weight distribution of separated segments of the dummy, to allow other materials to be used for head ballast, and to specify the instrument for measuring skin thickness. The details of these changes are recited in a memorandum incorporated into the drawing package.

Each of the final drawings is designated by the legend "NHTSA Release 8/1/73". Each drawing so designated is hereby incorporated as part of the test dummy specifications of 49 CFR Part 572. Subsequent changes in the drawings will not be made without notice and opportunity for comment.

The incorporation of the Part 572 test dummy into Standard No. 208 makes obsolete several test conditions of the standard that had been adopted to supplement the former test dummy specifications. The location, orientation, and sensitivity of test instrumentation formerly specified by sections S8.1.15 through S8.1.18 are now controlled by Part 572 and are no longer necessary within Standard No. 208. Similarly, the use of rubber components for the head, neck and torso joints as specified in Part 572, supplant the joint setting specifications for those joints in section S8.1.10 of the standard. The NHTSA has determined that the deletion of the above portions of the Standard No. 208 will have no effect on the substantive requirements of the standard and that notice and public procedure thereon are unnecessary.

In consideration of the foregoing, Title 49, Code of Federal Regulations, is amended by the revision of Motor Vehicle Safety Standard No. 208 (49 CFR § 571.208). . . .

In view of the pressing need for a test dummy to permit the continued development of passive restraint systems, and the fact that it presently only relates to a new option for compliance, the NHTSA finds that there is good cause to adopt an immediate effective date. Accordingly, Part 572 is effective August 1, 1973, and the amendment to Standard 208 is effective August 15, 1973.

Issued under the authority of sections 103 and 119 of the National Traffic and Motor Vehicle Safety Act, P.L. 89-563, 15 U.S.C. 1392, 1407, and the delegation of authority at 38 F.R. 12147.

Issued on July 26, 1973.

James E. Wilson
Associate Administrator
Traffic Safety Programs

38 F.R. 20449
August 1, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 69-7; Notice 29)

The purpose of this notice is to postpone the effective date of the requirements of Standards No. 208, Occupant Crash Protection, and 216, Roof Crush Resistance, applicable to the upcoming model year, from August 15, 1973 to September 1, 1973.

The amendment of the effective date was proposed in a notice published July 17, 1973 (38 F.R. 19049), in response to a petition filed by Chrysler Corporation. Chrysler had stated that the build-out of their 1973 models was in danger of running beyond the August 15 date, due to a variety of factors beyond the company's control. In proposing the postponement of the date, the NHTSA noted that the August 15 date had been chosen to coincide with the normal changeover date and that a delay would not appear to have any effect beyond allowing a slightly prolonged build-out.

The two comments submitted in response to the proposal were both favorable. The agency has not discovered any adverse consequences of a delay which would make it inadvisable, and has therefore decided to postpone the effective date as proposed.

In light of the foregoing, 49 CFR 571.208, Standard No. 208, Occupant Crash Protection, is amended by changing the date of August 14, 1973, appearing in S4.1.1 to August 31, 1973, and by changing the date of August 15, 1973, appearing in S4.1.2 to September 1, 1973. The effective date of 49 CFR 571.216, Standard No. 216, Roof Crush Resistance, is changed from August 15, 1973, to September 1, 1973.

Because this amendment relieves a restriction and imposes no additional burden, an effective date of less than 30 days from the date of issuance is found to be in the public interest.

(Sec. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on August 10, 1973.

James B. Gregory
Administrator

38 F.R. 21930
August 14, 1973

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 73-24; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to permit determination of the maintenance schedule for crash deployed occupant protection systems by reference to vehicle mileage and year and date of vehicle manufacture. The amendment responds to a rulemaking petition submitted by General Motors on May 21, 1973.

The present procedure for determining maintenance necessitates a change in labels each month. The two new methods published in a notice of proposed rulemaking on October 24, 1973 (38 F.R. 29341), avoid the label change and are phrased in typical warranty terms familiar to consumers. All comments received were in favor of the proposal and the standard is being amended accordingly.

In consideration of the foregoing, S4.5.1 of Motor Vehicle Safety Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, is amended....

Effective date: January 10, 1974. Because the amendment relaxes a requirement and creates no additional burden, it is found for good cause shown that an effective date earlier than one hundred eighty days after issuance is in the public interest.

(Secs. 103, 119, Pub. L. 89-563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on January 3, 1974.

James B. Gregory
Administrator

39 F.R. 1513
January 10 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74-4; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, by specifying emergency and special release requirements for seat belt assemblies that require no action by vehicle occupants (passive belts). This notice also sets out procedures for determination of whether a belt assembly qualifies as a passive restraint system in accordance with an interpretation published May 4, 1971 (36 F.R. 4600).

The passive belt release mechanism was proposed to grant a petition for rulemaking by Volkswagenwerk Aktiengesellschaft and Volkswagen of America, Inc. directed toward introduction of its passive belt system in its 1975 model cars (39 F.R. 3834, January 30, 1974). The proposed release mechanism, which reflects comments to an earlier proposal on release from passive belt systems (36 F.R. 12866, July 8, 1971) consists of a push-button latch release, guarded by a warning buzzer and interlock.

With the exception of Britax, Ltd., all comments favored a requirement for a manual release mechanism in passive belt systems, although most comments suggested changes in the proposal. One comment addressed to the adequacy of the Volkswagen belt system apparently did not understand that any passive belt system must meet the same injury criteria as any other passive system.

Britax pointed out the possibility of abuse of the manual release mechanism, but the NHTSA has concluded that the advantages of a release mechanism, as discussed in Notice 1, outweigh the disadvantages of possible abuse. The temptation to defeat the passive belt is less than it is with active belts, because the vehicle starts with the least inconvenience when the belt is permitted to work correctly.

The American Safety Equipment Corporation suggested that lever or pull-knob action would be a more satisfactory release mechanism than the push-button for occupants who only use the release infrequently and in emergency situations. There is a considerable advantage in uniformity, however, for those who do not normally use passive belt systems. The NHTSA specifies push-button action for all belt systems so that persons familiar with any belt system in any vehicle can operate the belt system of an unfamiliar vehicle. A person who operates typical 3-point active belts in his own car should be able to use the same push-button release action when he is a guest in a passive-belt equipped vehicle.

Manufacturers suggested several changes in the specifications for the warning buzzer and interlock guarding mechanism. American Motors recommended that the manufacturer be able to select either a starter interlock or the alternative power train interlock which has been proposed by the NHTSA. While there appear to be no disadvantages in such an option, the interlock requirements need not be changed until the NHTSA has acted on the alternative interlock proposal.

As proposed, the guarding features would operate if the release mechanism were unfastened. The Japan Automobile Manufacturers Association suggested addition of the option available in sequential interlocks, which operates the features if the belt length on the retractor indicates that the belt is not properly deployed. Such an option would be inappropriate, however, where there were no sequential system, because it would permit easy and permanent defeat of the system by knotting the belt after it had once been drawn from the retractor.

The proposal would have added a reference in S4.1.2.2 to the S4.5.3 passive belt exception in order to clarify their relationship. General Motors stated that, in actuality, the reference confused the relationship of S4 and S4.5.3 by implying that the S4.5.3 exception is limited to S4.1.2.2. The proposed addition will not be made.

Volkswagen suggested a clarification of the S7.2(b) latch mechanism requirement to remove the implication that a lap belt is required with the upper torso restraint, and this change has been made.

Volkswagen, in a March 8, 1974, letter request for interpretation, and General Motors in its comments, addressed the broad question of what constitutes a "passive" restraint system—one that requires "no action by vehicle occupants"—as those concepts are used in Standard No. 208. The NHTSA published an interpretation of what constitutes a "passive" restraint system on May 4, 1971 (36 F.R. 4600):

> The concept of an occupant protection system that requires "no action by vehicle occupants" as used in Standard No. 208 is intended to designate a system that requires no action other than would be required if the protective system were not present in the vehicle.

The NHTSA responded to Volkswagen's request with a letter further interpreting this concept as follows:

The question of what constitutes "no action by vehicle occupants" in a vehicle equipped with (presumptively) passive belts is best considered in two stages: (1) entry and exit from the vehicle, and (2) positioning of the belt for safety and comfort.

Entry and exit action "that requires no action other than would be required if the protective system were not present in the vehicle" means that a person is not hampered in his normal movements by the presence of the belt system. A test of this is whether a human occupant of approximately the dimensions of the 50th percentile adult male finds it necessary to take additional actions to displace the belt or associated components in order to enter or leave the seating position in question. An example of impermissible action would be the necessity of manually pushing a belt out of the way to gain access to the seat. Displacement of the components incidental to entry and exit, or merely for the convenience of the occupant would not be prohibited. Examples of permissible displacement would be brushing against the upper torso restraint during seating, or grasping the torso restraint to close the door.

The second question relates to the usefulness of the system once the occupant has been seated. The essence of a passive restraint is that it provides at least the minimum level of protection without relying on occupant action to deploy the restraint. At this stage, then, the question is whether an occupant who has seated himself without taking any "additional action" is in fact protected in a 30 mi/h impact. This can be measured by conducting the impact tests with the belt positioned on the test dummy in the orientation that results when a human occupant enters the vehicle according to the first test described above. It would not be required that the belt position itself for maximum comfort of the human occupant, if it met the safety requirements. For example, if the belt were to fall across the upper arm instead of the clavicle, but still passed the test, the system would be considered conforming.

The procedure for conducting this evaluation would be to have a human occupant enter the vehicle without taking any "additional actions" to displace the belt, to note the location of the belt on him before he exits, to position the test dummy in accordance with S8.1 of Standard 208, to position the belt as it positioned itself on the sample occupant, and then to conduct the impact tests. The exit evaluation would require the human occupant to be seated with the restraint normally deployed and then exit the vehicle without needing to take any separate actions to displace the belt.

In light of this interpretation, the NHTSA does not believe additional specification is required in the standard as requested by General Motors.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: May 27, 1974. On the basis of a determination that it is in the public interest to permit the introduction of a passive belt system concurrently with the 1975 passenger car model changes, it is found for good cause shown that an effective date earlier than 180 days following the date of issuance of this amendment is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718, 15 U.S.C. 1392, 1407; delegation of authority at 49 CFR 1.51.)

Issued on April 22, 1974.

James B. Gregory
Administrator

39 F.R. 14593
April 25, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–39; Notice 1)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, by eliminating the ignition interlock. Parallel changes are made to the passive seat belt provisions (S4.5.3) and the seat belt assembly requirements (S7.) of the standard.

This amendment is responsive to recently-enacted legislation which prohibits, after February 25, 1975, any Federal motor vehicle safety standard that requires or provides for use of a safety belt interlock system or a "continuous buzzer" warning. Pub. L. 93–492; § 109 (Oct. 28, 1974). The legislation further specifies that lap and shoulder belt assemblies shall be installed until the NHTSA undertakes further rulemaking on alternative systems. The NHTSA concludes that immediate action to delete the interlock option conforms to the intent of the legislation. Accordingly, S4.1.2.3, S4.5.3, and S7.4 have been modified as necessary to specify seat belt assemblies without an interlock that inhibits operation of the vehicle engine.

The legislation does not list the exact specifications of the warning system which will replace the "continuous buzzer" after 120 days, but it restricts the buzzer portion of any future warning to an 8-second period following operation of the ignition. Because the legislation leaves considerable regulatory discretion concerning warning systems, and a new system may require components not presently in manufacturers' inventories, the NHTSA finds it necessary and desirable to propose the new requirements in a separate notice, permitting opportunity for consideration and submission of comments by interested persons. Final action will be taken by December 27, 1974, to specify a new warning system as required by the statute.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: October 29, 1974. Because this amendment relieves a restriction and responds to a Congressional mandate expressed in the Motor Vehicle and Schoolbus Safety Amendments of 1974, the National Highway Traffic Safety Administration finds, for good cause shown, that notice and public procedure hereon are impracticable and unnecessary, and that an immediate effective date is in the public interest.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 109, 111 Pub. L. 93–492; delegation of authority at 49 CFR 1.51.)

Issued on October 29, 1974.

James B. Gregory
Administrator

39 F.R. 38380
October 31, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–39; Notice 3)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to establish a new warning system for seat belt assemblies to replace the present warning system after February 24, 1975. The new system is permitted as an alternative to the present requirements until February 24, 1975.

This amendment responds to recently-enacted legislation which prohibits, after February 24, 1975, any Federal motor vehicle safety standard that requires or provides for use of a safety belt interlock or a "continuous buzzer" warning. Pub. L. 93–492; § 109, October 27, 1974 (15 U.S.C. § 1410(b)). An earlier amendment of the standard revoked the interlock option (39 F.R. 38380, October 31, 1974). In prohibiting the "continuous buzzer", the legislation states that an acceptable buzzer would operate only during an 8–second period after the ignition is turned to the "start" or "on" position. The legislation placed no restriction on warning lights. The present warning system provisions in Standard No. 208 do not comply with the legislative limit on "continuous buzzers".

On October 29, 1974, the NHTSA proposed a modified warning that would consist of a continuous or flashing reminder light that operates only during the 4- to 8-second period after the ignition is operated, and a continuous or intermittent audible warning signal which operates only during the 4- to 8-second period after the ignition is operated if the driver's lap belt is not in use (39 F.R. 38391, October 31, 1974). The light would operate independently of belt use, so that the "Fasten Seat Belt" reminder would remain effective even if the belt were disabled to silence the audible warning. With a view to cost-effectiveness, the NHTSA proposed two other alternative courses of action. The first would require only a visual reminder signal as described above and the second would eliminate entirely requirements for belt-use warning or reminder systems.

The notice proposed that the new system be optional until February 25, 1975, so that a manufacturer could effectuate the transition on an orderly basis.

The comments received varied greatly in their recommendations on the principal proposal, the visual-only alternative, and the possibility of no warning system requirements at all. Ford believed that the limited duration of the warning would make it relatively ineffective, and that deleting the belt warning requirements would have the best overall effect on public acceptance of seat belts. General Motors supported a visual-only reminder, and proposed an optional means of providing that visual reminder. Chrysler Corporation argued for a more complex warning system that would sense belt use at the right front passenger position as well as the driver's position, and would include a continuous warning light in place of the 4- to 8-second visual reminder. Volkswagen supported the audible-visual combination but recommended that both signals act as a reminder and function independently of belt use.

Smiths Industries Limited, a manufacturer of interlock units, Economics and Science Planning, and Switches, Inc., recommended that the sequential warning feature remain as an added incentive to operate the belt system. Other comments completely supported or opposed the proposal and in some cases offered totally new suggestions.

The NHTSA has carefully weighed the comments submitted in order to specify the most reasonable belt warning system requirements available. NHTSA studies show that belt usage by front seat occupants of interlock-equipped cars currently is about 38 percent. If from this percentage is subtracted the percentage of persons who would fasten their seat belts regardless of forcing systems, it can be seen that the fraction of the population whose behavior will be affected by any warning system is quite small. Because of the limited benefit, the reminder should be provided at as low a cost as feasible.

Because an irritating light can be easily ignored or disabled, a visual signal can effectively serve only a reminder function, and as such, it should be as simple as possible. The NHTSA concludes that a 4- to 8-second reminder is best calculated to accomplish the advisory function.

Chrysler recommended that the warning and reminder system be installed at the right front passenger position, which would add significant retractor or buckle switch, wiring, and seat sensor costs. The NHTSA calculates that the driver's warning system (or belt use) will offer substantially the same reminder to a front seat passenger as a limited-duration signal at the passenger position.

The Administration has determined that an audible-visual combination will provide the best reminder at a cost commensurate with the benefits achievable in a limited-duration signal. Comments on the alternative proposals and on manufacturer-suggested options did not establish that variations on the principal proposal offered significantly greater safety benefit in the short or long term. Accordingly, Standard No. 208 is amended as proposed to adopt a new belt warning system, as an alternative to the present system until February 24, 1975, and as the only permissible belt warning system thereafter.

With regard to the warning's duration, Ford suggested that the range of signal duration be expanded to a longer 2- to 8-second duration to permit use of a more economical timer. This request is denied. The 4-second minimum duration was selected as the best compromise between the necessary manufacturer's tolerance and the duration necessary to alert the occupants fully.

Some manufacturers, such as American Motors Corporation, have considered the use of thermal timer mechanisms, which can be affected by extremes of ambient temperature and battery voltage, and by repeated cycling. Standard No. 208 does not presently specify an ambient temperature for testing. Because no temperature was proposed, and in view of the necessity of specifying a warning system to comply with the legislation by December 26, 1974, the NHTSA will issue the present amendment without an ambient temperature test condition. Until the question of the need for a temperature specification is resolved, this agency will consider that compliance with the requirements is required at moderate ambient temperatures. Performance of these systems will be observed with a view to further rulemaking on temperature, cycling, and other criteria.

It should be noted that the February 25, 1975, date proposed for mandatory use of the new system was calculated on an October 28, 1974, enactment of the "Motor Vehicle and Schoolbus Safety Amendments of 1974". In fact these amendments were enacted on October 27, 1974, and accordingly the "continuous buzzer" systems must be deleted by February 24, 1975, as is now reflected in the wording of this amendment.

In another area, White Motor Company has pointed out that the amendatory language in both notices of Docket No. 74-39 inadvertently included motor vehicles other than passenger cars in the belt warning requirement. The wording of this amendment corrects this error as to vehicles manufactured in the future. The requirements of S7.3 published in the Federal Register on October 31, 1974 (39 F.R. 38380) were intended to apply, and will be treated by this agency as applying, only to motor vehicles manufactured in accordance with S4.1.2 and S4.1.3.

In a matter related to seat belt modifications, the NHTSA hereby terminates rulemaking on a proposal to amend Standard No. 208 that would have permitted use of a drive train interlock mode in place of the ignition interlock mode to meet the "third option" belt interlock requirements of S4.1.2.3. A proposal on this alternative interlock was published January 23, 1974 (39 F.R. 2610). As noted earlier, the NHTSA has already modified S4.1.2.3 of the standard to specify seat belt assemblies without an interlock that inhibits operation of the vehicle engine. For this reason, it is appropriate to terminate further rulemaking on the alternative interlock mode. No further action in this area will be taken without further notice and opportunity for comment.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: December 3, 1974.

(Sec. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); Sec. 109, Pub. L. 93–492, 88 Stat. 1470 (15 U.S.C. 1410(b)); delegation of authority at (49 CFR 1.51).

Issued on December 2, 1974.

James B. Gregory
Administrator

39 F.R. 42692
December 6, 1974

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 75-14; Notice 2)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to permit until January 1, 1976, the installation of current seat belt assemblies in trucks and multipurpose passenger vehicles (MPV) with a gross vehicle weight rating of 10,000 pounds or less. This amendment was proposed (40 F.R. 23897, June 3, 1975) in response to petitions from Chrysler Corporation and Jeep Corporation.

In both the Jeep and Chrysler petitions and in comments on the proposal, vehicle manufacturers stated that the current economic situation may cause the continued production of 1975-model vehicles beyond August 15, 1975, after their production would normally have been terminated. Significant cost in obsolete material and in running changes would be involved in the introduction of the new 3-point belt systems in vehicles which are designed to accept lap belts only.

Ford Motor Company concurred in the proposal in view of obsolescence costs which might be avoided by the 4-month option. General Motors Corporation only indicated that it did not object to the proposal. The American Safety Belt Council emphasized the readiness of seat belt manufacturers to supply the new systems and the importance of a swift decision. They expressed support for the introduction of 3-point systems as soon as possible. The Recreational Vehicle Industry Association sought confirmation of its understanding that the proposal did not modify requirements for motor homes and forward control vehicles under S4.2. (RVIA's understanding is correct.) Chrysler and Jeep supported the proposal, and Jeep supplied production and retail cost information for which it requested confidentiality.

It is apparent from the nature of data submitted by manufacturers that the 20-day comment period did not allow adequate time for collection and development of the items enumerated in the preamble to the proposal. While it would be preferable to provide manufacturers more time to develop additional data, the NHTSA recognizes that virtually no time remains in which to make decisions for August 1975 production. The cost data already submitted by Jeep and the engineering changes submitted by Chrysler do permit an NHTSA judgment on cost objections of manufacturers under § 113 and on the advisability of the proposed modification.

Using the Chrysler submission as representative of the production changes to be undertaken by any manufacturer in effecting a running change to the seat belt systems of the 1975-model vehicles built after August 14, 1975, it is concluded that the total cost implications of these changes would be substantial if undertaken. The Jeep itemized cost information on production changes bore out this conclusion. In terms of obsolescence, it is confirmed by Ford that the decreased sales will result in obsolescence due to inability to balance out stocks of seat belts and other components in 1975-model vehicles.

Pursuant to § 113(b)(1) of the National Traffic and Motor Vehicle Safety Act (15 U.S.C. § 1402(b)(1), the information on which this evaluation is based is available in the NHTSA public docket (Docket No. 75-14, Notice 1; PRM #208-000022; PRM #105-000019) except for the Jeep submission. The NHTSA is presently determining whether the submission is entitled to confidential treatment. If it is not, the submission will be placed in Docket No. 75-14, Notice 1.

In all, the information submitted by manufacturers, particularly Chrysler, indicates that a substantial number of changes would be required to effect a running change to the vehicles in question after August 15, 1975. The cost data submitted by Jeep indicate that these changes will result in significant cost increases. The NHTSA has decided that the significant costs of the running changes in 1975-model vehicles whose production may be continued after August 15, 1975, are not justified for the numbers of vehicles that might be affected.

In consideration of the foregoing, Standard No. 208 (49 CFR 571.208) is amended. . . .

Effective date: July 9, 1975. Because this amendment concerns production decisions that must be made immediately for the model changes in September 1975, it is found for good cause shown that an immediate effective date is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on July 3, 1975.

James B. Gregory
Administrator

40 F.R. 28805
July 9, 1975

PREAMBLE TO AMENDMENT TO MOTOR VEHICLE SAFETY STANDARD NO. 208

Occupant Crash Protection

(Docket No. 74–14; Notice 4)

This notice amends Standard No. 208, *Occupant crash protection*, 49 CFR 571.208, to continue until August 31, 1976, the present three options available for occupant crash protection in passenger cars. This amendment replaces provisions of the standard which were to have come into effect on August 15, 1975, but were suspended as a result of the decision of the U.S. Court of Appeals for the Sixth Circuit in *Chrysler v. DOT*, 472 F2d 659 (6th Cir. 1972).

This extension of the present occupant crash protection options was proposed April 10, 1975 (40 F.R. 21617). Vehicle manufacturers and the American Safety Belt Council (ASBC) supported the proposal, but requested that the modifications apply indefinitely instead of being limited to a 1-year extension. Ford Motor Company, Chrysler Corporation, and Volkswagen of America also asked that the future provisions for light trucks and multipurpose passenger vehicles (MPV) (S4.2.3) be similarly modified. The California Traffic Safety Foundation and the Vehicle Equipment Safety Commission supported the proposal but only for the 1-year period for which it was proposed.

While the NHTSA recognizes that the present crash protection options will in all likelihood be in effect for some period after August 31, 1976, the agency has not proposed more than the 1-year extension. The Administrative Procedures Act specifies, with limited exceptions, that notice and opportunity to comment be provided interested persons in the case of agency rulemaking proceedings (§ 553(b)). The NHTSA intends to propose the long-term requirements for occupant crash protection, both for passenger cars and for light trucks and MPV's, as soon as possible.

Until that time, the NHTSA finds that manufacturers must be assured of the regulations for occupant crash protection as they apply to upcoming production. In consideration of the foregoing, Standard No. 208 (49 CFR § 571.208) is amended. . . .

Effective date: August 13, 1975. Because the present requirements for occupant crash protection terminate in less than 30 days and manufacturers need to be advised of the continuation of the requirements as soon as possible, it is found for good cause shown that an effective date sooner than 30 days following the date of publication is in the public interest.

(Secs. 103, 119, Pub. L. 89–563, 80 Stat. 718 (15 U.S.C. 1392, 1407); delegation of authority at 49 CFR 1.51.)

Issued on August 8, 1975.

James B. Gregory
Administrator

40 F.R. 33977
August 13, 1975

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